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CANCER FACTS & FIGURES

Estimated number of new cancer cases in 1986 by states, total: 930,000* (excluding Puerto Rico).

*Excluding non-melanoma skin cancer and carcinoma in situ.
BASED ON RATES FROM NCI SEER PROGRAM (1977-1981).

AMERICAN CANCER SOCIETY®

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*Table/Chart

SOURCES OF STATISTICS

Incidence

Since there is no national office which records every new cancer case, there is no way of knowing exactly how many new cases of cancer are diagnosed each year. In the past, estimates of cancer incidence were made by extrapolating from the experience of the few population-based cancer registries.

Estimates of incidence in *Facts & Figures* editions prior to 1974 were based on data from two state cancer registries. The issues from 1974 through 1978 used information from the National Cancer Institute's Third National Cancer Survey (1969-1971) of nine major areas of the United States.

Then in 1973, NCI began a new and larger program, gathering data from 11 population-based registries. It is called SEER, standing for Surveillance, Epidemiology and End Results. Beginning with the 1979 edition of *Facts & Figures*, SEER incidence information has been used. Each time a new data base is introduced, there may be some sharp changes in figures, due to the more accurate data. The changes do NOT indicate either a cancer epidemic or miracle cure.

For valid comparisons between years, incidence statistics from the 1974 through 1978 editions of *Facts & Figures* may be compared with one another, while those from the 1979 to 1984 editions may be compared.

The latest available information for this 1986 edition is SEER data from the years 1977-1981.

Mortality

The source for mortality statistics has remained constant over the years: the National Center for Health Statistics, Department of Health and Human Services.

The 1986 figures are estimates based on the latest available information, which includes mortality data through 1982.

Beginning with the 1981 edition of *Facts & Figures*, mortality rates per 100,000 population were age-adjusted to the 1970 census population, rather than the 1940 census population. Comparing these charts and figures with those of previous years may indicate false trends.

Survival

Because of the 5-year waiting period, survival statistics take longer to compile. In this edition, we show the latest survival rates for cases diagnosed in the period 1977-82 in the SEER program.

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CANCER: BASIC DATA

BASIC DATA

What is cancer?

Cancer is a large group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled or checked, it results in death. However, many cancers can be cured if detected and treated promptly.

How is cancer treated?

By surgery, X rays, radioactive substances, chemicals, hormones and immunotherapy.

Who gets cancer?

Cancer strikes at any age. It kills more children 3 to 14 than any other disease. And cancer strikes more frequently with advancing age. In the 1970's, there were an estimated 3.5 million cancer deaths, over 6.5 million new cancer cases, and more than 10 million people under medical care for cancer.

How many people alive today will get cancer?

About 73 million Americans now living will eventually have cancer; about 30%, according to present rates. Over the years, cancer will strike in approximately three out of four families.

How many people alive today have ever had cancer?

There are over 5 million Americans alive today who have a history of cancer, 3 million of them with diagnosis five or more years ago. Most of these 3 million can be considered cured, while others still have evidence of cancer. By "cured" is meant that a patient has no evidence of disease and has the same life expectancy as a person who never had cancer.

The decision as to when a patient may be considered cured is one that must be made by the physician after examining the individual patient. For most forms of cancer, five years without symptoms following treatment is the accepted time. However, some patients can be considered cured after one year, others after three years, whereas some have to be followed much longer than five years.

How many new cases will there be this year?

In 1986 about 930,000 people will be diagnosed as having cancer.*

How many people are surviving cancer?

In the early 1900's few cancer patients had any hope of long-term survival. In the 1930's less than one in five was alive at least five years after treatment. In the 1940's it was one in four, and in the 1960's it was one in three.

Today, about 375,000 Americans, or 4 out of 10 patients who get cancer this year, will be alive 5 years after diagnosis. The gain from 1 in 3 to 4 in 10 represents about 62,000 persons this year. This 4 in 10, or about 40% is called the "observed" survival rate. When normal life expectancy is taken into consideration (factors such as dying of heart disease, accidents and diseases of old age) 49% will be alive 5 years after diagnosis. This is the "relative" survival rate, and is considered a more accurate yardstick of our battle against cancer.

Could more people be saved?

Yes. About 164,000 people with cancer will probably die in 1986 who might have been saved by earlier diagnosis and prompt treatment.

How many people will die?

This year about 472,000 will die of the disease — 1,293 people a day, about one every 67 seconds. Of every five deaths from all causes in the U.S., one is from cancer. In 1985 an estimated 462,000 Americans died of cancer. In 1984 it was 452,000; in 1983 the figure was 442,986.

What is the national death rate?

There has been a steady rise in the age-adjusted** national death rate. In 1930 the number of cancer deaths per 100,000 population was 143. In 1940 it was 152. By 1950 it had risen to 158 and in 1983 the number was 169. The major cause of these increases has been cancer of the lung. Except for that form of cancer, age-adjusted cancer death rates for major sites are leveling off, and in some cases declining.

Can cancer be prevented?

Some cancers, not all. Most lung cancers are caused by cigarette smoking, and most skin cancers by frequent overexposure to direct sunlight. These cancers can be prevented by avoiding their causes. Certain cancers caused by occupational-environmental factors can be prevented by eliminating or reducing contact with carcinogenic agents. See Prevention section, pp. 17-20.

*These estimates of the incidence of cancer are based upon data from the National Cancer Institute's SEER Program (1977-1981). Non-melanoma skin cancer and carcinoma in situ have not been included in the statistics. The incidence of non-melanoma skin cancer is estimated to be over 400,000.

**Age-adjusted — a method used to make valid statistical comparisons by assuming the same age distribution among different groups being compared.

HOW CANCER WORKS

Normally, the cells that make up the body reproduce themselves in an orderly manner so that worn-out tissues are replaced, injuries are repaired and growth of the body proceeds.

Occasionally, certain cells undergo an abnormal change and begin a process of uncontrolled growth and spread: One cell divides into two, those redivide into four, and so on. These cells may grow into masses of tissue called tumors — some benign and others malignant (cancerous).

The danger of cancer is that it invades and destroys normal tissue. In the beginning, cancer cells usually remain at their original site, and the cancer is said to be localized. Later, some cancer cells may invade neighboring organs or tissue. This occurs either by direct extension of growth or by becoming detached and carried through the lymph or blood systems to other parts of the body. This is called metastasis of a cancer.

This spread may be regional — confined to one region of the body — when cells are trapped by lymph nodes. If left untreated, however, the cancer is likely to spread throughout the body. That condition is known as advanced cancer, and usually results in death.

Because a case of cancer becomes progressively more serious with each stage, it is important to detect cancer as early as possible. Aids to early detection include cancer's Seven Warning Signals and the cancer risk factors.

TRENDS IN DIAGNOSIS AND TREATMENT

Cancer management today is becoming increasingly individualized both with respect to diagnostic procedures and treatment. Early detection is followed by a precise staging of the disease, and the use of more than one kind of therapy, often in combination.

A number of cancers, which only a few decades ago had very poor prognoses, are today being cured in many cases: acute lymphocytic leukemia in children, Hodgkin's disease, Burkitt's lymphoma, Ewing's sarcoma (a form of bone cancer), Wilms' tumor (a form of kidney cancer in children), rhabdomyosarcoma (a cancer that forms in certain muscle tissue), choriocarcinoma (placental cancer), testicular cancer, ovarian cancer and osteogenic sarcoma. Other cancers are being more effectively controlled than in the past.

An outstanding example of progress is the improvement in the management of testicular cancer in young men. Better disease staging in certain cases, and the use of new and improved combinations of cancer drugs has resulted in remarkably improved survival. In less than 20 years, the five-year survival rate for all cases rose from 63% to 88% for these cancers.

The following developments indicate the directions of current and future research:

- A genetic fusing of cancer cells can produce disease-fighting "monoclonal antibodies" — specific antibodies tailored to seek out chosen targets on cancer cells. The potential of monoclonal antibodies in the diagnosis and treatment of cancer is under study.
- A series of chemical injections near the spine can act as a nerve block, relieving certain cancer patients of debilitating pain. Understanding the effect of available analgesics has made the control of chronic pain more effective. Using oral pain medicine on a regular basis can relieve pain for most cancer patients.
- Chemoprevention studies with agents like synthetic retinoids (cousins of Vitamin A), beta-carotene, folic acid, and other vitamins and minerals are being undertaken to see if recurrences of certain cancers can be prevented. The next step is to see if these agents can reduce cancer in high risk persons. Studies of dietary intervention will examine the effect of low-fat diets in women with stage II breast cancer.
- About fifty drugs have been found effective against certain cancers, and others that are still being tested hold promise.
- Many patients with bone cancer now are treated successfully by removing and replacing a section of bone rather than by amputating the leg or arm. Drugs and radiation therapy are being used effectively following surgery, resulting in dramatic improvement in survival.
- Computerized tomography (CT scanning) uses X rays to examine the brain and other parts of the body. Cross-section pictures are constructed which show a tumor's shape and location more accurately than is possible with conventional x-ray techniques.
  For patients undergoing radiation therapy, CT Scanning may enable the therapist to pinpoint the tumor more precisely in order to provide more accurate radiation dosage while sparing normal tissue.
- Immunotherapy holds hope of harnessing the body's own disease-fighting systems to combat cancer with minimal toxicity.
- Many cancers are caused by a two-stage process through exposure to two different kinds of substances known as initiators and promotors. Researchers are exploring ways of interrupting the process, thereby preventing the development of cancer.
- The transfusion of blood components is becoming increasingly available and effective as a support in cancer therapy. Platelets are used to prevent hemorrhaging, and red blood cells to combat anemia. The control of infection, a common complication in cancer patients, can be better controlled due to new understanding of antibiotic treatment and newer antibodies.
- New technologies have made it possible to use bone marrow transplantation as an important treatment option in selected patients with leukemia and aplastic

anemia. Its effect in other cancers is being studied.

- Hyperthermia, the use of heat to kill cancer cells, may play a vital role in future cancer treatment. Hyperthermia is being studied in combination with radiation therapy or chemotherapeutic drugs to determine if a synergistic response can be produced.
- With medical progress producing longer survival periods for cancer patients, clinical concerns are expanding to include not only patients' physical well-being, but also their psychosocial needs. The patient's and family's reactions to the disease, sexual concerns, employment and insurance needs and ways to provide psychosocial support have emerged as important areas of research and clinical care.
- Nuclear Magnetic Resonance (NMR) is a noninvasive imaging technique. It uses a huge electromagnet to detect tumors by sensing the vibrations of the different atoms in the body. NMR could revolutionize the diagnosis of cancer and other diseases.
- HTLV (human T-cell leukemia virus) is believed by many to be the first bona fide cancer virus in humans. This discovery has made possible the detection of antibodies in people who may be at high risk to a particular leukemia. It is hoped that soon a vaccine can be made to prevent this type of cancer.
- Intraoperative radiation is being studied as a way to give x-ray treatment at the time of surgery. The technique can give doses of X ray directly to the tumor and may be able to eliminate residual cancer cells.
- Improvements in chemotherapy, radiation therapy and surgical techniques have made possible more conservative management of early cancers. This has meant in the case of early larynx cancers that many patients have been able to retain their voice; and in colorectal cancers, fewer permanent colostomies are needed.
- Techniques such as thermography (heat patterns), ultrasound (high-frequency sound waves) and diaphanoscopy (inspection with a beam of light) are currently being studied for their possible effectiveness and appropriate use in detecting early breast cancer.

HOW TO ESTIMATE CANCER STATISTICS LOCALLY

Community Population	Estimated No. Who are Alive, Saved from Cancer	Estimated No. Cancer Cases Under Medical Care in 1986	Estimated No. Who Will Die of Cancer in 1986	Estimated No. of New Cases in 1986	Estimated No. Who Will be Saved from Cancer in 1986	Estimated No. Who Will Eventually Develop Cancer	Estimated No. Who Will Die of Cancer if Present Rates Continue
1,000	10	5	1	3	1	280	180
2,000	20	11	4	7	3	560	360
3,000	30	16	5	10	4	840	540
4,000	40	21	7	13	5	1,120	720
5,000	50	26	9	16	6	1,400	900
10,000	100	52	18	33	12	2,800	1,800
25,000	250	131	45	79	30	7,000	4,500
50,000	500	162	90	158	59	14,000	9,000
100,000	1,000	525	180	325	122	28,000	18,000
200,000	2,000	1,050	360	650	244	56,000	36,000
500,000	5,000	2,625	900	1,575	590	140,000	90,000

NOTE: The figures can only be the roughest approximation of actual data for your community and should be used with caution. It is suggested that every effort be made to obtain actual data from a Registry source.

NEW CANCER CASES—1986
Estimated New Cancer Cases for All Sites Plus Major Sites, by State—1986

	ALL SITES*	MAJOR SITES								
STATE	Number of Cases	Female Breast	Colon-Rectum	Lung	Oral	Uterus	Prostate	Stomach	Pancreas	Leukemia
Alabama	16,500	1,800	1,900	2,800	450	1,000	1,800	350	425	450
Alaska	700	100-	75	125	20	25	75	20	10	20
Arizona	11,500	1,400	1,600	1,900	275	500	1,100	200	250	275
Arkansas	10,100	1,000	1,200	1,800	300	500	1,100	200	300	300
California	92,000	12,600	13,200	14,700	3,000	4,700	8,900	2,700	2,600	2,600
Colorado	8,500	1,100	1,300	1,200	200	400	1,000	200	250	250
Connecticut	14,000	2,300	2,100	2,000	500	700	1,400	400	400	400
Delaware	2,800	400	400	450	100	150	250	60	50	40
Dist. of Columbia	3,200	450	400	450	250	250	425	100	100	60
Florida	58,500	6,900	8,400	10,100	2,000	2,700	6,200	1,300	1,400	1,400
Georgia	20,000	2,100	2,400	3,400	750	1,200	2,000	400	450	500
Hawaii	2,800	325	375	400	125	100	225	200	60	70
Idaho	3,000	475	375	375	75	125	325	70	80	100
Illinois	45,000	6,500	7,300	7,500	1,600	2,500	4,000	1,400	1,300	1,300
Indiana	22,000	3,000	3,500	3,700	500	1,500	2,000	450	550	600
Iowa	11,500	1,600	2,500	1,700	300	550	1,300	300	350	400
Kansas	9,000	1,200	1,500	1,600	300	450	950	200	300	300
Kentucky	15,300	1,600	2,200	2,900	500	750	1,200	300	375	400
Louisiana	15,500	1,800	2,100	2,700	550	900	1,400	400	400	450
Maine	5.300	700	800	850	175	300	425	150	150	125
Maryland	17,500	2,600	2,800	2,900	700	900	1,600	400	400	425
Massachusetts	26,500	3,800	4,300	3,700	1,000	1,200	2,300	850	650	700
Michigan	34,500	4,500	5,000	5,500	1,100	1,900	3,500	900	850	950
Minnesota	15,000	2,200	2,400	2,000	375	750	1,700	500	450	500
Mississippi	9,800	950	1,300	1,800	300	600	1,100	275	300	300
Missouri	22,000	2,600	3,400	3,800	550	1,300	2,100	500	550	700
Montana	3,000	350	400	400	80	150	425	80	80	80
Nebraska	6,400	850	1,100	900	175	300	750	175	225	225
Nevada	3,400	350	400	600	90	150	250	20	60	40
New Hampshire	3,900	550	650	550	100	225	350	75	90	125
New Jersey	33,500	5,100	5,500	5,200	1,100	2,000	3,000	1,200	900	900
New Mexico	4,200	500	500	550	100	225	425	90	90	70
New York	75,500	11,900	13,000	10,900	2,700	4,600	6,700	2,800	2,400	2,100
North Carolina	23,000	2,800	3,000	3,700	750	1,400	2,500	425	600	600
North Dakota	2,500	375	425	300	60	100	350	100	80	70
Ohio	45,000	6,500	7,100	7,400	1,500	2,700	4,200	1,200	1,300	1,400
Oklahoma	12,500	1,400	1,900	2,300	375	600	1,200	300	325	375
Oregon	11,000	1,300	1,400	1,800	275	500	1,000	225	300	325
Pennsylvania	56,000	7,600	10,200	8,300	1,800	2,900	5,000	1,600	1,500	1,500
Rhode Island	4,900	650	950	700	225	225	400	200	150	80
South Carolina	11,500	1,400	1,400	2,000	400	750	1,300	200	300	250
South Dakota	2,600	425	475	400	70	125	300	80	90	100
Tennessee	19,000	2,100	2,600	3,500	550	1,000	1,800	350	500	550
Texas	49,000	5,700	6,300	8,000	1,600	2,500	4,500	1,300	1,200	1,600
Utah	3,200	500	425	300	80	150	450	80	80	80
Vermont	2,100	300	350	350	60	100	200	50	50	60
Virginia	21,000	2,500	2,700	3,600	650	1,100	2,100	425	475	500
Washington	16,000	2,100	2,200	2,600	475	800	1,500	375	425	475
West Virginia	8,000	950	1,000	1,500	200	500	650	200	250	250
Wisconsin	19,000	2,600	3,000	2,600	550	900	2,100	600	500	600
Wyoming	1,300	200	200	200	40	50	175	25	30	30
United States	930,000	123,000	140,000	149,000	30,000	50,000	90,000	25,000	25,000	26,000
Puerto Rico	6,000	450	450	350	425	750	400	500	100	175

* Does not include carcinoma in situ or non-melanoma skin cancer.

These estimates are offered as a rough guide and should not be regarded as definitive. They are calculated according to the distribution of estimated 1986 cancer deaths by state. Especially note that year-to-year changes may only represent improvements in the basic data.

CANCER DEATHS—1986
Estimated Cancer Deaths for All Sites Plus Major Sites, by State—1986

	ALL SITES		MAJOR SITES								
STATE	Number of Deaths	Death Rate per 100,000 Population	Female Breast	Colon-Rectum	Lung	Oral	Uterus	Prostate	Stomach	Pancreas	Leukemia
Alabama	8,300	203	600	800	2,500	125	200	475	200	400	300
Alaska	400	84	30	30	100	5	10	15	10	10	10
Arizona	5,800	165	450	600	1,700	100	50	275	125	250	175
Arkansas	5,200	211	350	550	1,700	100	100	325	150	275	225
California	47,000	180	4,200	5,600	12,900	850	900	2,600	1,500	2,400	1,700
Colorado	4,300	125	400	550	1,200	70	70	275	125	225	175
Connecticut	7,000	224	650	900	1,800	175	125	350	250	375	275
Delaware	1,400	227	125	200	350	25	20	70	30	60	40
Dist. of Columbia	1,700	309	175	200	400	75	60	100	60	100	40
Florida	29,800	249	2,300	3,600	8,400	450	400	1,800	800	1,500	850
Georgia	10,000	169	700	950	3,100	200	250	550	225	475	350
Hawaii	1,400	130	100	150	300	30	20	60	90	70	50
Idaho	1,500	135	125	150	325	25	25	90	40	75	70
Illinois	23,500	205	2,100	3,200	6,200	500	600	1,200	750	1,300	900
Indiana	11,000	196	1,000	1,500	3,200	200	300	550	250	550	425
Iowa	6,000	203	550	1,000	1,600	100	125	400	150	325	300
Kansas	4,700	194	425	650	1,500	100	100	300	125	250	200
Kentucky	7,800	199	550	950	2,600	175	175	425	150	375	275
Louisiana	8,000	176	600	850	2,400	175	175	450	250	450	300
Maine	2,600	218	225	350	700	50	60	150	90	150	80
Maryland	9,000	205	700	1,200	2,700	200	175	450	225	400	275
Massachusetts	13,300	233	1,300	2,000	3,300	325	275	650	500	650	450
Michigan	17,600	188	1,500	2,200	4,800	325	400	950	475	850	650
Minnesota	7,600	179	700	1,000	1,900	150	125	500	250	425	350
Mississippi	4,800	180	325	550	1,600	90	100	350	125	300	200
Missouri	11,100	221	850	1,400	3,200	200	250	600	275	500	400
Montana	1,500	176	125	175	350	30	30	125	50	90	60
Nebraska	3,300	205	300	500	800	60	70	225	125	200	175
Nevada	1,700	155	100	150	425	25	20	70	10	70	30
New Hampshire	2,000	189	200	300	475	40	40	100	40	90	70
New Jersey	17,000	228	1,600	2,400	4,400	350	375	900	650	850	550
New Mexico	2,000	138	175	200	425	25	40	100	50	100	60
New York	38,400	228	4,000	5,800	9,400	850	950	1,900	1,600	2,100	1,400
North Carolina	11,500	184	850	1,200	3,200	225	275	700	250	500	400
North Dakota	1,300	194	100	175	250	20	20	100	60	80	50
Ohio	23,200	215	2,000	3,100	6,400	425	600	1,200	650	1,200	800
Oklahoma	6,400	193	450	800	2,100	100	100	375	150	300	250
Oregon	5,300	173	425	600	1,600	100	75	325	125	275	200
Pennsylvania	28,400	241	2,400	4,300	7,000	500	700	1,500	850	1,400	950
Rhode Island	2,500	263	250	400	600	60	40	150	100	100	70
South Carolina	5,700	168	425	550	1,800	100	125	325	125	300	175
South Dakota	1,400	201	125	200	300	20	30	100	50	100	80
Tennessee	9,600	196	650	1,000	3,000	200	200	500	225	450	325
Texas	24,400	150	1,800	2,600	7,000	425	500	1,300	700	1,300	1,000
Utah	1,700	88	175	175	250	20	30	125	50	80	70
Vermont	1,100	200	100	150	275	20	30	70	30	50	40
Virginia	10,600	185	800	1,200	3,200	175	225	550	250	475	325
Washington	7,900	169	650	950	2,400	150	150	425	200	400	300
West Virginia	4,100	205	300	475	1,400	75	100	225	100	200	150
Wisconsin	9,500	193	900	1,400	2,300	175	175	600	325	500	375
Wyoming	700	114	70	70	175	10	10	50	15	50	30
United States	472,000	196	40,000	60,000	130,000	9,000	10,000	26,000	14,000	24,000	17,000
Puerto Rico	3,000	94	125	125	300	175	150	225	400	100	150

ESTIMATED NEW CANCER CASES AND DEATHS BY SEX FOR ALL SITES — 1986*

	ESTIMATED NEW CASES			ESTIMATED DEATHS		
	Total	Male	Female	Total	Male	Female
ALL SITES	930,000*	465,000*	465,000*	472,000	253,500	218,500
Buccal Cavity & Pharynx (ORAL)	29,500	19,800	9,700	9,400	6,350	3,050
Lip	4,600	4,000	600	175	150	25
Tongue	5,300	3,300	2,000	2,100	1,400	700
Mouth	10,700	6,300	4,400	2,825	1,800	1,025
Pharynx	8,900	6,200	2,700	4,300	3,000	1,300
Digestive Organs	217,800	110,700	107,100	119,700	62,500	57,200
Esophagus	9,300	6,600	2,700	8,800	6,400	2,400
Stomach	24,700	15,000	9,700	14,300	8,400	5,900
Small Intestine	2,200	1,100	1,100	800	400	400
Large Intestine, Rectum (COLON-RECTUM)	98,000	45,000	53,000	51,800	24,800	27,000
Rectum (COLON-RECTUM)	42,000	22,000	20,000	8,200	4,300	3,900
Liver & Biliary Passages	13,600	6,800	6,800	10,600	5,300	5,300
Pancreas	25,500	13,000	12,500	24,000	12,300	11,700
Other & Unspecified Digestive	2,500	1,200	1,300	1,200	600	600
Respiratory System	164,500	112,300	52,200	135,350	93,000	42,350
Larynx	11,700	9,600	2,100	3,800	3,100	700
LUNG	149,000	100,000	49,000	130,100	89,000	41,100
Other & Unspecified Respiratory	3,800	2,700	1,100	1,450	900	550
Bone	2,000	1,100	900	1,400	800	600
Connective Tissue	5,100	2,700	2,400	2,800	1,300	1,500
SKIN	23,000**	12,000**	11,000**	7,500†	4,500	3,000
BREAST	123,900***	900***	123,000***	40,200	300	39,900
Genital Organs	169,800	96,400	73,400	49,400	27,000	22,400
Cervix, Uteri (UTERUS)	14,000***	—	14,000***	6,800	—	6,800
Corpus, Endometrium (UTERUS)	36,000	—	36,000	2,900	—	2,900
Ovary	19,000	—	19,000	11,600	—	11,600
Other & Unspecified Genital, Female	4,400	—	4,400	1,100	—	1,100
Prostate	90,000	90,000	—	26,100	26,100	—
Testis	5,100	5,100	—	500	500	—
Other & Unspecified Genital, Male	1,300	1,300	—	400	400	—
Urinary Organs	60,500	41,700	18,800	19,800	12,800	7,000
Bladder	40,500	29,000	11,500	10,600	7,200	3,400
Kidney & Other Urinary	20,000	12,700	7,300	9,200	5,600	3,600
Eye	1,800	900	900	400	200	200
Brain & Central Nervous System	13,800	7,700	6,100	10,200	5,500	4,700
Endocrine Glands	11,700	3,500	8,200	1,750	750	1,000
Thyroid	10,600	2,900	7,700	1,100	400	700
Other Endocrine	1,100	600	500	650	350	300
Leukemias	25,600	14,000	11,600	17,400	9,600	7,800
Lymphocytic Leukemia	12,300	6,900	5,400	6,600	3,800	2,800
Granulocytic Leukemia	12,600	6,700	5,900	10,400	5,600	4,800
Monocytic Leukemia	700	400	300	400	200	200
Other Blood & Lymph Tissues	44,500	22,800	21,700	23,700	12,300	11,400
Hodgkin's Disease	6,900	3,900	3,000	1,500	900	600
Multiple Myeloma	10,400	5,200	5,200	7,600	3,900	3,700
Other Lymphomas	27,200	13,700	13,500	14,600	7,500	7,100
All Other & Unspecified Sites	36,500	18,500	18,000	33,000	16,600	16,400

NOTE: The estimates of new cancer cases are offered as a rough guide and should not be regarded as definitive. Especially note that year-to-year changes may only represent improvements in the basic data. ACS six major sites in boldface caps.

*Carcinoma in situ and non-melanoma skin cancers are not included in totals. Carcinoma in situ of the uterine cervix accounts for more than 45,000 new cases annually, and carcinoma in situ of the female breast accounts for more than 5,000 new cases annually. Non-melanoma skin cancer accounts for more than 400,000 new cases annually.

**Melanoma only. ***Invasive cancer only. †Melanoma 5,600; other skin 1,900

INCIDENCE ESTIMATES ARE BASED ON RATES FROM NCI SEER PROGRAM 1977-1981.

MAJOR CANCER SITES

LUNG CANCER

Incidence: An estimated 149,000 new cases in 1986. The incidence rate in white males dropped from 82.7 per 100,000 in 1982 to 79.3 in 1983. However, the incidence rate in white females and in black males and females continued to rise.

Mortality: An estimated 130,000 deaths in 1986.The age-standardized lung cancer death rate for women is higher than that of any other cancer. It has surpassed breast cancer which for over 50 years was the number one cancer killer of women.

Warning Signals: A persistent cough; sputum streaked with blood; chest pain; recurring attacks of pneumonia or bronchitis.

Risk Factors: Cigarette smoking; history of smoking 20 or more years; exposure to certain industrial substances such as asbestos, particularly for those who smoke.

Early Detection: Lung cancer is very difficult to detect early; symptoms often don't appear until the disease has advanced considerably. If a smoker quits at the time of early precancerous cellular changes, the damaged bronchial lining often returns to normal. If a smoker continues the habit, cells may form abnormal growth patterns that lead to cancer. Diagnosis may be aided by such procedures as the chest X ray, sputum cytology test and fiber-optic bronchoscopy.

Treatment: Treatment depends on the type of, and stage of lung cancer. Surgery, radiation therapy and chemotherapy are all options. For many localized cancers, surgery is usually the treatment of choice. Since the majority of patients with lung cancer have tumor spread, radiation therapy and chemotherapy are often combined with surgery. In small cell cancer of the lung, chemotherapy alone or combined with radiation has largely replaced surgery as the treatment of choice, with a large percentage of patients experiencing remission — in some cases, long-lasting remission.

Survival: Only 13% of lung cancer patients (all stages, whites and blacks) live five or more years after diagnosis. The rate is 41% for cases detected in a localized stage; but only 20% of lung cancers are discovered that early. Rates have improved only slightly over a recent 10-year period.

COLON AND RECTUM CANCER

Incidence: An estimated 140,000 new cases in 1986, including 98,000 of colon cancer and 42,000 of rectum cancer. Their combined incidence is second only to that of lung cancer (excluding common skin cancers).

Mortality: An estimated 60,000 deaths in 1986, second only to lung cancer. This includes 51,800 for colon cancer and 8,200 for rectum cancer.

Warning Signals: Bleeding from the rectum, blood in the stool, change in bowel habits.

Risk Factors: Personal or family history of colon and rectum cancer; personal or family history of polyps in the colon or rectum; inflammatory bowel disease.

Evidence suggests that bowel cancer may be linked to the diet. A diet high in fat and/or deficient in fiber content may be a significant causative factor.

Early Detection: The ACS recommends three tests as valuable aids in detecting colon and rectum cancer early in people without symptoms.

The digital rectal examination is performed by a physician during an office visit. The ACS recommends one every year after age 40.

The stool blood slide test is a simple method of testing the feces for hidden blood. The specimen is obtained by the patient at home, and returned to the physician's office, a hospital or clinic for examination. The ACS recommends the test every year after 50.

Proctosigmoidoscopy, known as the "procto," is an examination in which a physician inspects the rectum and lower colon with a hollow lighted tube. As the site of most colorectal cancers appears to be shifting higher in the colon, longer, flexible instruments are being used as well as the rigid scope. The ACS recommends a procto every 3 to 5 years after the age of 50, following two annual exams with negative results.

If any of these tests reveals possible problems, a physician may recommend more extensive studies, such as colonoscopy and a barium enema. Colonoscopes view the entire colon.

A national ACS study on colon and rectum cancer attitudes by the public* found that Americans over age 40 tend to pay these organs scant attention and have them checked infrequently by their physicians. Most study participants incorrectly thought the disease usually is found in an advanced stage when survival chances are slim. Many also erroneously regarded a permanent colostomy as a normal result of colon and rectum cancer. On the other hand, participants were receptive to accurate information about the disease, and expressed a willingness to practice early detection procedures.

Treatment: Surgery, at times combined with radiation, is the most effective method of treating colorectal cancer. Chemotherapy is being studied to determine its possible role in treating advanced cases.

In cases of colon cancer, a permanent colostomy, the creation of an abdominal opening for the elimination of body wastes, is seldom needed, and is infrequently required for patients with rectal cancer. One report found permanent colostomies necessary for only 15% of patients whose rectal cancers are detected early. For those who do have permanent colostomies, the Society has a special patient assistance program. (See p. 22)

Survival: When colorectal cancer is detected and treated in an early, localized stage, the 5-year survival rate is 90% for colon cancer and 80% for rectal cancer, compared with 51% and 38% respectively, after the cancer has spread to other parts of the body.

*Leo J. Shapiro & Assoc., Inc., 1982.

BREAST CANCER

Incidence: An estimated 123,000 new cases in the United States during 1986. About one out of 11 women will develop breast cancer at some time during her life.

Mortality: An estimated 40,200 deaths (39,900 females; 300 males) in 1986, in females, second only to lung cancer, now the foremost site of cancer deaths in women.

Warning Signals: Breast changes that persist such as a lump, thickening, swelling, dimpling, skin irritation, distortion, retraction or scaliness of the nipple, nipple discharge, pain or tenderness.

Risk Factors: Over age 50; personal or family history of breast cancer; never had children; first child after age 30.

Early Detection: The American Cancer Society recommends the monthly practice of breast self-examination (BSE) by women 20 years and older as a routine good health habit. Most breast lumps are not cancer, but only a physician can make a diagnosis.

The American Cancer Society and the National Cancer Institute, in their joint Breast Cancer Detection Demonstration program, found that mammography — a low-dose x-ray examination — could find cancers too small to be felt by the most experienced examiner.

Besides its effectiveness in screening women without symptoms, mammography is recognized as a valuable diagnostic technique for women who do have findings suggestive of breast cancer. Once a breast lump is found, mammography can help determine if there are other lesions in the same or opposite breast which are too small to be felt. All suspicious lumps should be biopsied for a definitive diagnosis — even when the mammogram is described as normal.

The Society recommends a mammogram every year for asymptomatic women age 50 and over, and a baseline mammogram for those 35 to 39. Asymptomatic women 40 to 49 should have mammography every 1-2 years, depending on physical and mammographic findings as well as other risk factors. In addition, a professional breast examination is recommended every three years for women 20 to 40, and every year for those over 40.

Treatment: Several methods may be used, depending on the individual woman's preferences and medical situation — surgery varying from local removal of the tumor to mastectomy, radiation therapy, chemotherapy or hormone manipulation. Often two or more methods may be used in combination. Patients should discuss with their physicians possible options available concerning the specific management of their breast cancer.

New techniques in recent years have made breast reconstruction possible after mastectomy, and the cosmetic results are good. Reconstruction now has become an important part of treatment and rehabilitation. (See p. 22)

Survival: The 5-year survival rate for localized breast cancer has risen from 78% in the 1940's to 91% today. If the breast cancer is not invasive (in situ), the survival rate approaches 100%. If the cancer has spread, however, the rate is 59%.

Despite an increasing incidence of breast cancer, longer survival has helped to stabilize mortality rates over the last 50 years.

SKIN CANCER

Incidence: Over 400,000 cases a year, the vast majority of which are highly curable basal or squamous cell cancers. They are more common among individuals with lightly pigmented skin, living at latitudes near the equator. The most serious skin cancer is malignant melanoma, which strikes about 23,000 men and women each year.

Mortality: An estimated 7,500 deaths a year, 5,600 from malignant melanoma, and 1,900 due to other skin cancers.

Warning Signals: Any unusual skin condition, especially a change in the size or color of a mole or other darkly pigmented growth or spot.

Risk Factors: Excessive exposure to the sun; fair complexion; occupational exposure to coal tar, pitch, creosote, arsenic compounds or radium. Among blacks, because of heavy skin pigmentation, skin cancer is negligible.

Prevention: Avoid the sun between 10 a.m. and 3 p.m. when ultraviolet rays are strongest, and by using protective clothing. Use one of a number of sunscreen preparations, especially those containing such ingredients as PABA (para-aminobenzoic acid). They come in varying strengths, ranging from those that permit gradual tanning to those allowing practically no tanning at all.

Early Detection: Recognition of changes in or the appearance of new skin growths is the best way to find early skin cancer. Basal and squamous cell skin cancers often take the form of a pale, waxlike, pearly nodule, or a red, scaly, sharply outlined patch.

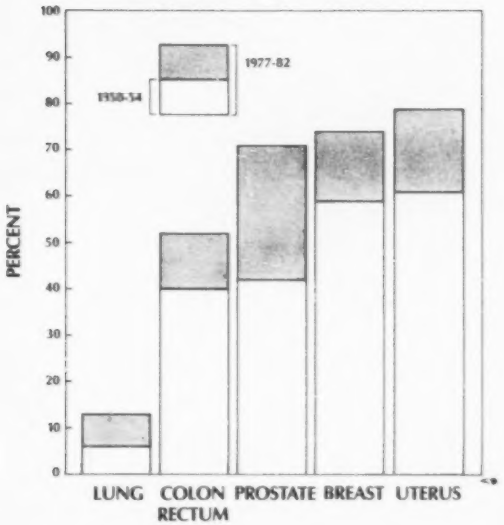
Melanomas are usually distinguished by a dark brown or black pigmentation. They start as small, mole-like growths that increase in size, change color, become ulcerated and bleed easily from a slight injury. Early detection is critical.

Treatment: There are four methods of treatment — surgery, radiation therapy, electrodesiccation (tissue destruction by heat), or cryosurgery (tissue destruction by freezing).

For malignant melanoma, adequate surgical excision of the primary growth is indicated. Nearby lymph nodes may be removed. The microscopic examination of all suspicious moles is essential.

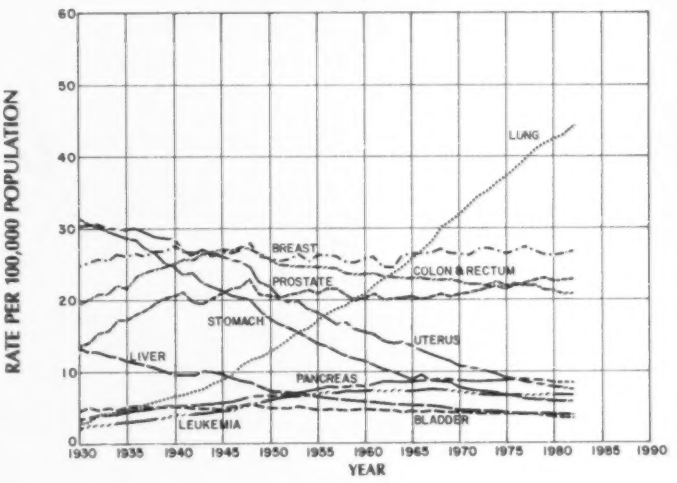
Survival: For basal cell and squamous cell cancers, cure is virtually assured with early detection and treatment. Malignant melanoma can spread to other parts of the body quickly. However, in the earliest stages, with proper treatment, it is curable. The 5-year survival rate for white patients with malignant melanoma is 83% compared with 95% for patients with other kinds of skin cancer.

FIVE YEAR CANCER SURVIVAL RATES* TRENDS FOR SELECTED SITES— 1950-54 to 1977-82



*Adjusted for normal life expectancy.
Source: Biometry Branch, National Cancer Institute

CANCER DEATH RATES* BY SITE UNITED STATES, 1930-82



* Rate for the population standardized for age on the 1970 U.S. population
Sources of Data: National Center for Health Statistics and Bureau of the Census, United States.
Note: Rates are for both sexes combined except breast and uterus female population only and prostate male population only.

UTERINE CANCER

Incidence: An estimated 50,000 new invasive cases in 1986, including 14,000 cases of cancer of the cervix, and 36,000 cases of cancer of the endometrium or body of the uterus. Invasive cervical cancer incidence has steadily decreased over the years, while cancer in situ has risen in all groups. Cervical cancer is most common today among low socioeconomic groups but all groups are at risk. Endometrial cancer afflicts mostly mature women, and diagnosis usually is made between the ages of 55 and 69.

Mortality: An estimated 6,800 deaths in 1986 from cervical cancer, 2,900 from endometrial cancer. Overall, the death rate from uterine cancer has decreased more than 70% during the last 40 years, due mainly to the Pap test and regular checkups.

Warning Signals: Intermenstrual or postmenopausal bleeding or unusual discharge.

Risk Factors: For cervical cancer: early age at first intercourse, multiple sex partners. For endometrial cancer: history of infertility, failure of ovulation, prolonged estrogen therapy and obesity.

Early Detection: The Pap test, an examination under a microscope of cells from the cervix and body of the uterus, is a simple procedure which can be performed at appropriate intervals by physicians as part of every pelvic examination. For the average risk person, a Pap test is recommended once every three years after two initial negative tests one year apart.

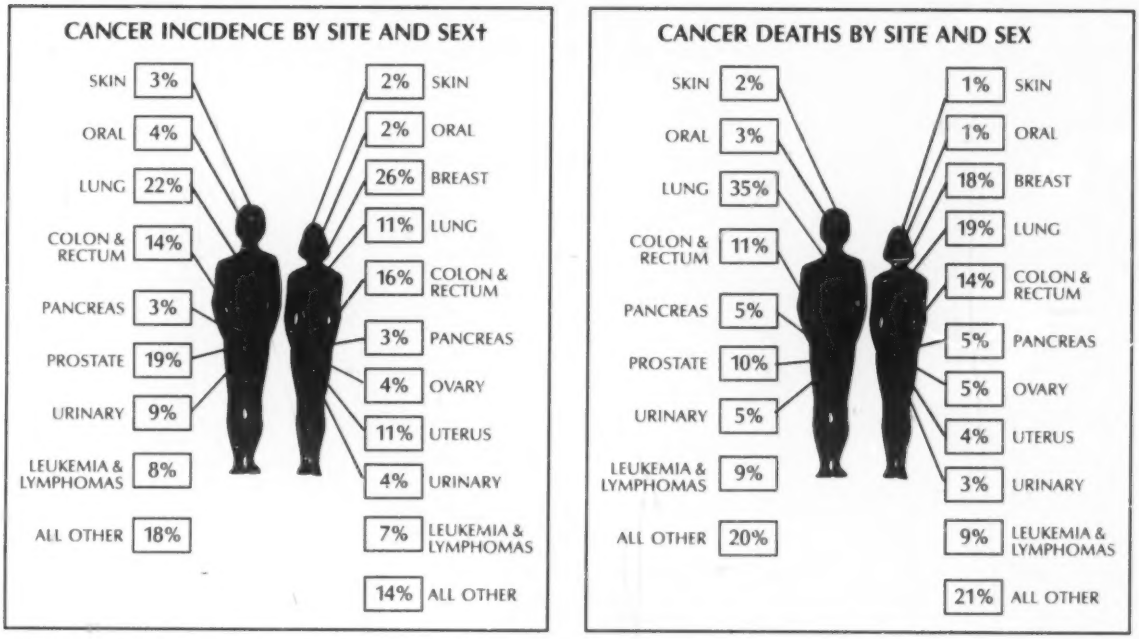
The Pap test is highly effective in detecting early cancer of the uterine cervix; it is only 50% effective in detecting endometrial cancer. Women at high risk of developing endometrial cancer should have an endometrial tissue sample at menopause.

The hormone estrogen frequently is given to women during and after menopause to make up for the decline in estrogens normally produced by the ovaries. Estrogen helps to control menopausal symptoms such as hot flashes or thinning of the vaginal lining causing painful sexual intercourse. For older women, there are certain risks associated with such treatment, including an increased risk of endometrial cancer. Women and their physicians should carefully discuss the use of postmenopausal estrogens in terms of the benefit and risk to the individual patient.

Treatment: Uterine cancers generally are treated by surgery or radiation, or by a combination of the two. In precancerous (in situ) stages, changes in the cervix may be treated by cryotherapy (the destruction of cells by extreme cold), by electrocoagulation (the destruction of tissue through intense heat by electric current) or by local surgery. Precancerous endometrial changes may be treated with the hormone progesterone.

Survival: The 5-year survival rate for cervical cancer patients, whites and blacks, is 62%. For patients diagnosed early, however, the rate is 80-90%. Cancer in situ is virtually 100%. The figures for endometrial cancer are 84% all stages, 92% early and virtually 100% for endometrial precancerous lesions. During a recent 10-year period, there was moderate improvement for both uterine sites.

CANCER INCIDENCE AND DEATHS BY SITE AND SEX—1986 ESTIMATES



†Excluding non-melanoma skin cancer and carcinoma in situ.

LEUKEMIA

Incidence: An estimated 25,600 new cases in 1986, about half of them acute leukemia, and half of them chronic leukemia. Although it is often thought of as primarily a childhood disease, leukemia strikes many more adults (23,600 cases per year compared with 2,000 in children). Acute lymphocytic leukemia accounts for about 1,600 of the cases of leukemia among children, whereas in adults the most common types are acute granulocytic (about 7,700 cases annually), and chronic lymphocytic (9,500 cases annually).

Mortality: An estimated 17,400 deaths in 1986.

Warning Signals: Symptoms of acute leukemia in children can appear suddenly. Early signs may include fatigue, paleness, weight loss, repeated infections, easy bruising, nose bleeds or other hemorrhages. Chronic leukemia can progress slowly and with few symptoms.

Risk Factors: Leukemia, a cancer of the bloodforming tissues, strikes both sexes and all ages. Causes of most cases are unknown. Individuals with Down's syndrome (mongolism) and certain other hereditary abnormalities have higher than normal incidence of leukemia. It has also been linked to excessive exposure to radiation and certain chemicals such as benzene.

Early Detection: Leukemia may be difficult to diagnose early because symptoms often appear to be those of other less serious conditions. When a physician does suspect leukemia, a diagnosis can be made through blood tests and an examination of bone marrow.

Treatment: Chemotherapy is the most effective method of treating leukemia. Today, continuing research in 80 U.S. medical centers is yielding new and better drugs for treating leukemia patients. A variety of anticancer drugs are used, either in combinations or as single agents. To prevent persistence of hidden cells, therapy of the central nervous system has become standard treatment, especially in acute lymphocytic leukemia. Under appropriate conditions, bone marrow transplantation may be useful in the treatment of certain leukemias.

When leukemia occurs, millions of abnormal, immature white blood cells are released into the circulatory systems. These abnormal cells crowd out normal white cells to fight infection, platelets to control hemorrhaging and red blood cells to prevent anemia. Transfusions of blood components and antibiotics are used as supportive treatments.

Survival: The overall, average 5-year survival rate for white patients with leukemia is 34%, due partly to very poor survival of patients with some types of leukemia such as acute granulocytic. The 5-year survival rate for black patients is 29%. Over the last 30 years, however, there has been a dramatic improvement in survival of patients with acute lymphocytic leukemia: From a 5-year survival of 4% for white males diagnosed in the early 1960's to 27% in the early 1970's to 42% around 1980; For white females diagnosed in the same time periods, from 3% to 29% to 49%. In white children, the improvement has been from 4% to 68%. Moreover, in some medical centers, optimum treatment has raised survival of children with acute lymphocytic leukemia up to 75%.

ORAL CANCER

Incidence: An estimated 29,500 new cases in 1986. Incidence is more than twice as high in males as in females, and is most frequent in men over age 40. Cancer can affect any part of the oral cavity, from lip to tongue to mouth and throat.

Mortality: An estimated 9,400 deaths in 1986.

Warning Signals: A sore that bleeds easily and doesn't heal; a lump or thickening; a reddish or whitish patch that persists. Difficulty in chewing, swallowing or moving tongue or jaws are often late changes.

Risk Factors: Cigarette, cigar and pipe smoking; use of chewing tobacco; more than moderate drinking.

Early Detection: Dentists have the opportunity, through regular checkups, to see abnormal tissue changes and to detect cancer at an early and curable stage.

Treatment: Principal methods are radiation therapy and surgery. Chemotherapy is being studied as an aid to surgery in advanced disease.

Survival: Five-year survival rates vary substantially depending on the site. Rates range from 31% for cancer of the pharynx to 92% for lip cancer. Overall, 5-year survival for oral cancer patients is about 52%.

CANCER BY AGE AND RACE

CANCER RATES IN MINORITIES*

A study of cancer rates over several decades shows that the cancer incidence rate for blacks is higher than for whites, and that the death rate is also higher. Male incidence and mortality rates in each race increased, while female rates decreased.

The overall cancer incidence rate for blacks went up 27%, while for whites it increased 12%. Cancer mortality has increased in both races, but the rate for blacks is greater than for whites. The rates were virtually the same 30 years ago. Since then, cancer death rates in whites have increased 10%, while black rates have increased 40%.

Cancer sites where blacks had significantly higher increases in incidence and mortality rates included the lung, colon-rectum, prostate and esophagus. Esophageal cancer, long considered mainly a disease of males, declined in whites and rose rapidly in blacks of both sexes.

The incidence of invasive cancer of the uterine cervix dropped in both black and white women, although the incidence in blacks is still more than double that in whites. However, the rate for endometrial cancer — or cancer of the body of the uterus — for white women is double that of black women.

Survival rates for patients diagnosed between 1967 and 1973 were compared for whites and blacks. More whites than blacks had cancer diagnosed in an early, localized stage when the chances of cure are best: 37% versus 28% for males, and 42% versus 31% for women.

An ACS-sponsored survey by the black-owned firm of Evaxx, Inc. showed that urban black Americans tend to be much less knowledgeable than whites about cancer's warning signals, and less apt to see a doctor if they experience those symptoms. Specifically, the blacks interviewed knew little about three of the cancers that have seen a sharp increase in mortality: colorectal, prostate and esophageal. The survey also showed that blacks tend to underestimate both the prevalence of cancer and the chances of cure.

Hispanic Attitudes Toward Cancer

A recent ACS-sponsored report delineated Hispanic attitudes toward cancer, cancer risk reduction and early detection. The study, conducted for the Society by the firm of Clark, Martire and Bartolomeo, Inc., underscored an urgent need for extensive cancer education and information programs directed to Hispanic-Americans. Survey findings showed that Hispanic-Americans are not adequately aware of most of the warning signals of cancer or of ways to reduce cancer risk, and that they tend not to seek early detection or treatment. The study identified the key psychological, cultural and economic barriers impeding the fight against cancer in the Hispanic-American community.

*Figures for cancer incidence are from the National Cancer Institute National Surveys, 1947, and the NCI SEER Program, 1973-1981; those for cancer mortality from the National Center for Health Statistics, 1951-53 to 1981-83

CANCER IN CHILDREN

Incidence: An estimated 6,550 new cases in 1986, making it rare as a childhood disease. Common sites include the blood and bone marrow, bone, lymph nodes, brain, nervous system, kidneys and soft tissues.

Mortality: An estimated 2,175 deaths in 1986, about half of them from leukemia. Despite its rarity, cancer is the chief cause of death by disease in children between the ages of 3 and 14. Mortality has declined from 8.3 per 100,000 in 1950 to 4.1 in 1983.

Early Detection: Cancers in children often are difficult to recognize. Parents should see that their children have regular medical checkups, and be alert to any unusual symptoms that persist. They include: unusual mass or swelling; unexplained paleness and loss of energy; sudden tendency to bruise; persistent, localized pain or limping; prolonged, unexplained fever or illness; frequent headaches, often with vomiting; sudden eye or vision changes; and excessive, rapid weight loss.

Main Childhood Cancers

Leukemia: See preceding section.

Osteogenic Sarcoma and *Ewing's Sarcoma* are bone cancers. There may be no pain at first, but swelling in the area of the tumor is often a first sign.

Neuroblastoma can appear anywhere but usually in the abdomen, where a swelling occurs.

Rhabdomyosarcoma, the most common soft tissue sarcoma, can occur in the head and neck area, genito-urinary area, trunk and extremities.

Brain Cancers in early stages may cause headaches, blurred or double vision, dizziness, difficulty in walking or handling objects, and nausea.

Lymphomas, and *Hodgkin's Disease* are cancers that involve the lymph nodes, and also may invade bone marrow and other organs. They may cause swelling of lymph nodes in the neck, armpit or groin. Other symptoms may include general weakness and possibly fever.

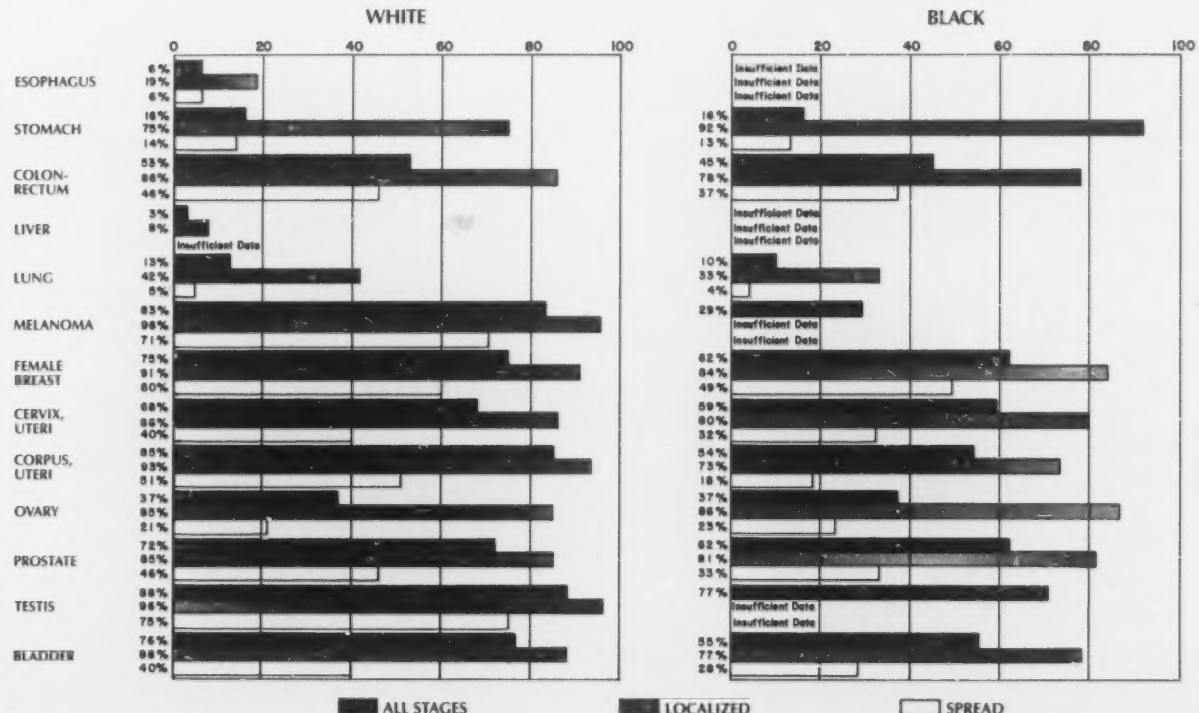
Retinoblastoma, or an eye cancer, usually occurs in children under the age of four. When detected early, cure is possible with appropriate treatment.

Wilms' Tumor, a kidney cancer, may be recognized by a swelling or lump in the abdomen.

Treatment: Childhood cancers can be treated by a combination of therapies, coordinated by a team of experts. They include oncologic physicians, pediatric nurses, social workers, psychologists and others who assist children and their families.

Survival: Five-year survival rates vary considerably, depending on the site. Among those for white children: bone cancer, 47%; neuroblastoma, 51%; brain and central nervous system, 53%; Wilms' tumor (kidney), 81%; and Hodgkin's disease, 88%. (Data for black children is insufficient.)

FIVE YEAR CANCER SURVIVAL RATES* FOR SELECTED SITES BY RACE



*Adjusted for normal life expectancy
This chart is based on cases diagnosed in 1977-1982

Source: Biometry Branch, National Cancer Institute

TRENDS IN SURVIVAL BY SITE OF CANCER, BY RACE
Cases Diagnosed in 1960-63, 1970-73, 1973-76, 1977-82

SITE	WHITE				BLACK			
	RELATIVE 5-YEAR SURVIVAL				RELATIVE 5-YEAR SURVIVAL			
	1960-63[1]	1970-73[1]	1973-76[2]	1977-82[2]	1960-63[1]	1970-73[1]	1973-76[2]	1977-82[2]
Esophagus	4%	4%	5%	7%	1%	4%	3%	3%
Stomach	11	13	14	15	8	13	15	16
Colon	43	49	50	53	34	37	46	47
Rectum	38	45	48	51	27	30	39	37
Lung and Bronchus	8	10	12	13	5	7	10	10
Melanoma of Skin	60	68	78	80	*	*	*	*
Breast (Female)	63	68	74	75	46	51	63	63
Uterine Cervix	58	64	68	68	47	61	64	59
Uterine Corpus	73	81	89	85	31	44	59	56
Ovary	32	36	36	37	32	32	40	37
Prostate	50	63	67	72	35	55	57	62
Testis	63	72	77	88	*	*	69	77
Bladder	53	61	74	76	24	36	47	56
Kidney	37	46	48	47	38	44	46	53
Brain	18	20	21	22	19	19	22	26
Hodgkin's Disease	40	67	69	73	*	*	66	74
Non-Hodgkin's Lymphoma	31	41	46	49	*	*	48	49
Leukemia	14	22	33	34	*	*	29	29

Source: Biometry Branch, National Cancer Institute

[1]Rates are based on data from a series of hospital registries and one population-based registry.

[2]Rates are from the SEER Program and include patients diagnosed through 1982 and follow-up on all patients through 1983. They are based on data from population-based registries in Connecticut, New Mexico, Utah, Iowa, Hawaii, Atlanta, Detroit, Seattle-Puget Sound, and San Francisco-Oakland.

*Rates could not be calculated because of insufficient number of cases.

ESTIMATED NEW CASES AND DEATHS FOR MAJOR SITES OF CANCER—1986*

SITE	NO. OF CASES	DEATHS
Lung	149,000	130,100
Colon-Rectum	140,000	60,000
Breast (Female)	123,000	40,000
Prostate	90,000	26,100
Urinary	60,500	19,800
Uterus	50,000**	9,700
Oral	29,500	9,400
Leukemia	25,600	17,400
Pancreas	25,500	24,000
Skin	23,000***	7,500
Ovary	19,000	11,600

*Figures rounded to nearest 1,000.
**If carcinoma in situ is included, cases total over 100,000.
***Estimated new cases of non-melanoma over 400,000.
INCIDENCE ESTIMATES ARE BASED ON RATES FROM N.C.I. SEER PROGRAM 1977-1981.

TRENDS IN AGE-ADJUSTED CANCER DEATH RATES* PER 100,000 POPULATION BY STATES FOR THE LAST THREE DECADES

	ALL SITES		
STATE	1950-59	1960-69	1970-79
Alabama	133.0	144.6	161.4
Alaska	—	147.2	161.5
Arizona	130.8	143.3	145.1
Arkansas	123.7	140.4	155.4
California	154.5	159.2	166.2
Colorado	141.8	136.6	137.1
Connecticut	180.5	175.5	177.8
Delaware	164.9	176.2	189.8
Dist. of Columbia	205.0	213.5	233.5
Florida	136.2	150.7	163.6
Georgia	134.9	145.9	160.0
Hawaii	—	150.4	143.0
Idaho	129.5	132.5	137.7
Illinois	172.1	173.3	177.6
Indiana	154.9	161.5	170.6
Iowa	149.0	150.6	158.8
Kansas	135.2	142.3	153.4
Kentucky	138.2	150.3	169.1
Louisiana	161.4	170.2	180.3
Maine	168.1	170.6	176.7
Maryland	173.1	181.3	193.9
Massachusetts	178.8	172.3	179.4
Michigan	169.6	170.9	174.0
Minnesota	152.7	151.9	152.7
Mississippi	133.8	148.3	158.4
Missouri	154.8	159.5	168.3
Montana	143.3	146.2	151.5
Nebraska	152.2	151.0	154.9
Nevada	141.7	155.6	163.4
New Hampshire	173.4	175.3	179.4
New Jersey	189.6	185.8	187.7
New Mexico	124.9	132.8	142.9
New York	186.1	183.0	182.7
North Carolina	124.0	138.7	157.7
North Dakota	139.4	142.7	143.0
Ohio	166.3	171.8	178.3
Oklahoma	140.3	146.8	155.2
Oregon	143.0	146.9	155.2
Pennsylvania	172.2	173.9	176.9
Rhode Island	183.2	184.3	189.4
South Carolina	132.7	144.7	161.4
South Dakota	145.4	145.7	146.8
Tennessee	135.9	145.7	161.3
Texas	137.8	148.7	158.4
Utah	125.0	125.0	122.0
Vermont	161.9	165.6	170.7
Virginia	142.8	156.3	171.2
Washington	152.5	153.3	160.6
West Virginia	140.7	153.8	166.0
Wisconsin	161.8	156.4	159.5
Wyoming	134.0	131.2	141.9
United States	158.3	162.4	169.0

*Rate for the population standardized for age on the 1970 U.S. population.

PREVENTION

	PRIMARY PREVENTION refers to steps that might be taken to avoid those factors that might lead to the development of cancer.
SMOKING	Cigarette smoking is responsible for 85% of lung cancer cases among men and 75% among women — about 83% overall. Smoking accounts for about 30% of all cancer deaths. Those who smoke two or more packs of cigarettes a day have lung cancer mortality rates 15 to 25 times greater than nonsmokers.
NUTRITION	Risk for colon, breast and uterine cancers increases for obese people. High-fat diet may be a factor in the development of certain cancers such as breast, colon and prostate. High-fiber foods may help reduce risk of colon cancer. Foods rich in vitamins A and C may help lower risk for cancers of larynx, esophagus and lung. Eating cruciferous vegetables may help protect against certain cancers. Salt-cured, smoked and nitrite-cured foods have been linked to esophageal and stomach cancer. The heavy use of alcohol, especially when accompanied by cigarette smoking or chewing tobacco, increases risk of cancers of the mouth, larynx, throat, esophagus, and liver. (See below)
SUNLIGHT	Almost all of the more than 400,000 cases of non-melanoma skin cancer developed each year in the U.S. are considered to be sun-related. Recent epidemiological evidence shows that sun exposure is a major factor in the development of melanoma and that the incidence increases for those living near the equator. (See Major Cancer Sites: Skin Cancer)
ALCOHOL	Oral cancer and cancers of the larynx, throat, esophagus,and liver occur more frequently among heavy drinkers of alcohol. (See Major Cancer Sites: Oral Cancer)
SMOKELESS TOBACCOS	Increased risk factor for cancers of the mouth, larynx, throat, and esophagus. Highly habit forming. (See Major Cancer Sites: Lung Cancer and Oral Cancer)
ESTROGEN	For mature women, certain risks associated with estrogen treatment to control menopausal symptoms, including an increased risk of endometrial cancer. However, estrogen can be given safely under careful physician control. (See Major Cancer Sites: Uterine Cancer)
RADIATION	Excessive exposure to X ray can increase cancer risk. Most medical X rays are adjusted to deliver the lowest dose possible without sacrificing image quality.
OCCUPATIONAL HAZARDS	Exposure to a number of industrial agents (nickel, chromate, asbestos, vinyl chloride, etc.) increases risk. Risk factor greatly increased when combined with smoking.
	SECONDARY PREVENTION refers to steps to be taken to diagnose a cancer or precursor as early as possible after it has developed.
COLORECTAL TESTS	The ACS recommends three tests for the early detection of colon and rectum cancer in people without symptoms. The digital rectal examination, performed by a physician during an office visit, should be performed every year after the age of 40; the stool blood test is recommended every year after 50; and the proctosigmoidoscopy examination should be carried out every 3 to 5 years after the age of 50 following two annual exams with negative results. (See Major Cancer Sites: Colon and Rectum Cancer)
PAP TEST	For the average risk person, a Pap test is recommended annually until two consecutive satisfactory tests are negative, and then once every three years. The Pap test is highly effective in detecting cancer of the uterine cervix, but is less effective in detecting endometrial cancer.
BREAST CANCER DETECTION	The ACS recommends the monthly practice of breast self-examination (BSE) by women 20 years and older as a routine good health habit. Physical examination of the breast should be done every three years from ages 20-40 and then every year. The ACS recommends a mammogram every year for asymptomatic women age 50 and over, and a baseline mammogram between ages 35 and 39. Women 40 to 49 should have mammography every 1-2 years, depending on physical and mammographic findings.

COLORECTAL CANCER: EARLY DETECTION IS THE KEY

When cancer of the colon and rectum is found and treated in an early, localized stage, the 5-year survival rate is 90% for colon cancer and 80% for rectal cancer. However, survival figures drop to 51% and 38%, respectively, after the cancer has spread to other parts of the body.

Because colorectal cancer develops over a period of time, detection of the disease is possible long before symptoms appear. Early detection of small cancers and polyps reduces the likelihood of major surgery and the need for a colostomy — an abdominal opening created for the elimination of wastes. In fact, permanent colostomies are rare in cases of colon cancer, and are necessary in only 15% of rectal cancer cases.

Colorectal cancer is second only to lung cancer in terms of incidence. Currently, about 140,000 new cases develop each year; more than 60,000 people die from the disease annually. The incidence of colorectal cancer tends to increase with age, starting at 40 years. More than 94% of all cases occur after the age of 50. Colorectal cancer occurs about equally in both sexes. Anyone with a personal or family history of colorectal cancer, polyps in the colon or inflammatory bowel disease, is at particularly high risk for the disease and should be examined carefully.

Projected 5-year survival rates for colorectal cancer show that early detection saves lives. Currently, the 5-year survival rate is estimated at 55%. With the use of early detection techniques such as the digital rectal exam, the stool blood test and sigmoidoscopy, and with appropriate management, the survival rate for patients with colorectal cancer could be increased from 55% to 85%. This means that, over a period of time, 100,000 lives, versus the current 60,000, could be saved each year.

It is recommended that the following procedures, all part of a cancer-related checkup, be performed at designated intervals:

- A digital rectal examination every year after age 40.
- A stool blood test every year after age 50.
- A procto every three to five years after the age of 50, following two annual examinations with negative results.

These guidelines apply only to people without symptoms. Persons with rectal bleeding; gnawing, cramping abdominal pain; or a change in bowel habits should see their physicians immediately.

Evidence suggests that bowel cancer may be linked to the diet. A diet high in fat and/or deficient in fiber content may be a significant causative factor.

NUTRITION AND CANCER: A COMMON SENSE APPROACH

Extensive research is under way to evaluate and clarify the role diet and nutrition play in the development of cancer. At this point, no direct cause-and-effect relationship has been proved, though statistics show that some foods may increase or decrease the risks for certain types of cancer. Evidence indicates that people might reduce their cancer risk by observing the following recommendations:

1. Avoid obesity.

Individuals 40% or more overweight increase their risk of colon, breast, prostate, gallbladder, ovary, and uterine cancers. People with weight problems should consult their physician to determine their best body weight, since their medical condition and body build must be taken into account. Physicians can recommend a suitable diet and exercise regimen to help maintain an appropriate weight.

2. Cut down on total fat intake.

A diet high in fat may be a factor in the development of certain cancers, particularly breast, colon and prostate. In addition, by avoiding fatty foods, people are better able to control body weight.

3. Eat more high-fiber foods such as whole grain cereals, fruits and vegetables.

Regular consumption of cereals, fresh fruits and vegetables is recommended. Studies suggest that diets high in fiber may help to reduce the risk of colon cancer. Furthermore, foods high in fiber content are a wholesome substitute for foods high in fat.

4. Include foods rich in vitamins A and C in your daily diet.

People should include in their diet dark green and deep yellow fresh vegetables and fruits, such as carrots, spinach, sweet potatoes, peaches, and apricots as sources of vitamin A; and oranges, grapefruit, strawberries, green and red peppers for vitamin C. These foods may help lower risk for cancers of the larynx, esophagus and the lung. The excess use of vitamin A supplements is not recommended because of possible toxicity.

5. Include cruciferous vegetables in your diet.

Certain vegetables in the cruciferous family — cabbage, broccoli, brussels sprouts, kohlrabi and cauliflower — may help prevent certain cancers from developing. Research is in progress to determine how these foods may protect against cancer. Cruciferous vegetables have flowers with four leaves in the pattern of a cross.

6. Eat moderately of salt-cured, smoked and nitrite-cured foods.

In areas of the world where salt-cured and smoked foods are eaten frequently, there is more incidence of cancer of the esophagus and stomach. The American food industry has developed new processes to avoid possible cancer-causing by-products.

7. Keep alcohol consumption moderate, if you do drink.

The heavy use of alcohol, especially when accompanied by cigarette smoking or smokeless tobacco, increases risk of cancers of the mouth, larynx, throat, esophagus and liver.

SMOKING

The American Cancer Society estimates that cigarette smoking is responsible for 85% of lung cancer cases among men and 75% among women — about 83% overall.

The cancer death rate for male cigarette smokers is more than double that of nonsmokers, and the rate for female smokers is 67% higher than for nonsmokers.

The higher cancer rates for men reflect the fact that in the past, more men than women smoked, and smoked more heavily. In recent years, however, the gap between male and female smoking has been narrowing.

Smoking also has been implicated in cancers of the mouth, pharynx, larynx, esophagus, pancreas and bladder. Smoking accounts for about 30% of all cancer deaths, is a major cause of heart disease, and is linked to conditions ranging from colds and gastric ulcers to chronic bronchitis and emphysema.

Smoking is related to 320,000 deaths each year. A September 1985 study by the U.S. Congress Office of Technology Assessment estimates the cost of smoking to the economy from $38 billion to $95 billion, with a middle estimate of $65 billion. This amounts to $2.17 in lost productivity and the treatment of smoking-related diseases for each pack of cigarettes sold.

A Decline in Smoking

A September 1985 tobacco report of the U.S. Department of Agriculture estimates cigarette output in 1985 at 662 billion, down 1.0% from last year. Consumption during the same period dropped about 0.3%.

From 1976 to 1985, adult male smokers (20 years and older) dropped from 42% of the population to 33%, while women smokers decreased from 32% to 28%, according to the National Center for Health Statistics. Overall, the percentage of adult smokers in the population had dropped to 32.0%. Other recent polls indicate that the proportion of smokers may have dropped to 30%.

Per capita cigarette consumption among adults has fallen — from 4,141 in 1974 to 3,384 in 1985 — reflecting a growing number of ex-smokers. This is the lowest per capita consumption since 1944. From 1965 to 1983, the proportion of adult male ex-smokers (20 years and older) in the total U.S. population increased from 20.5% to 30.3%, while female ex-smokers rose from 8.2% to 15.9%.

A survey supported by the National Institute on Drug Abuse indicated that the percentage of high school seniors (aged 17 and 18) who smoked cigarettes daily decreased from 28.8% in 1976 to 21.2% in 1983.

It is now estimated — from past national surveys and data from the Cancer Prevention Study II — that there are about 37 million ex-cigarette smokers in the U.S. today.

At the same time, however, the average smoker appears to be smoking more heavily. The U.S. Office on Smoking and Health reports that the proportion of adult male smokers (20 years and older) consuming 25 or more cigarettes per day increased from 31.0% to 34.1% between 1976 and 1980, and female smokers from 19.6% to 23.7%.

Figures from the U.S. Department of Agriculture show that a total of 600 billion cigarettes were consumed in 1984, the same as in 1983, following a 5.4% decrease from 1982. Preliminary figures indicate there may be another drop of nearly 1.0% in cigarette consumption in 1985.

Risk Awareness

A Federal Trade Commission staff report states that although most Americans are aware of a health risk in smoking, more than 40% don't know smoking causes most lung cancer, and 20% don't know it can cause cancer at all. More than 30% are unaware that smoking doubles a person's risk of heart attack, and 50% of women do not know that smoking during pregnancy increases the risk of stillbirth and miscarriage.

Lower Tar & Nicotine

Research has shown that there is no such thing as a "safe" cigarette, but that those who are not yet able to quit would be well advised to switch to brands with the lowest possible tar and nicotine (T/N) content. Moreover, low T/N smokers find it easier to quit altogether than high T/N smokers.

In an ACS study conducted from 1960 to 1972, the average mortality of low T/N smokers was 16% lower than that of high T/N smokers, and the comparable figure for lung cancer mortality was 26%.

It is important to remember that besides tar and nicotine, cigarette smoke contains a host of other poisonous gases such as hydrogen cyanide, volatile aromatic hydrocarbons, and especially carbon monoxide — possibly a critical factor in coronary heart disease and fetal growth retardation, among other things. While some hazards are reduced slightly by cigarette filters, certain filtered brands have been found to actually deliver more carbon monoxide than those without filters.

Passive Smoking Hazards

There may even be hazards for non-smokers who breathe the smoke of others' cigarettes. Several scientific studies, including a recent study by the American Cancer Society, have found an increased risk of lung cancer among nonsmoking wives of cigarette smokers. Although some studies have not shown an effect, evidence continues to grow indicating that "passive smoking" is a hazard.

The Society's Cancer Prevention Study II, involving more than one million Americans, will include a careful assessment of cancer risk and other diseases among smokers and passive smokers.

Industrial Hazards

Industrial workers are especially susceptible to lung diseases due to the combined effects of cigarette smoking and exposure to toxic industrial substances such as fumes from rubber, chlorine and dust from cotton and coal. Exposure to asbestos in combination with cigarette smoking increases an individual's cancer risk nearly 60 times.

In his 1982 report, *The Health Consequences of Smoking,* U.S. Surgeon General C. Everett Koop confirmed many of the ACS findings, declaring that cigarette smoking is "the chief, single, avoidable cause of death in our society, and the most important health issue of our time."

CANCER-RELATED CHECKUP GUIDELINES

Guidelines for the early detection of cancer in people without symptoms are recommended by the American Cancer Society as follows:

A cancer-related checkup:

- every 3 years for those 20-40 years of age.
- every year for those 40 and over.

The Society advises the public to talk with their doctors and ask how the guidelines relate to them. The checkup should always include health counseling (such as tips on quitting smoking) and examinations for cancer of the thyroid, testes, prostate, mouth, ovaries, skin and lymph nodes.

In particular:

- Ages 20-40 — For breast cancer, an examination by a physician every three years, a self-exam every month, and one baseline breast X ray between the ages of 35 and 40. For uterine cancer, a pelvic exam every three years and a Pap test at least every three years after two initial negative tests one year apart (including women under 20 if sexually active.)
- Ages 40 and over — For breast cancer, a professional exam every year, a self-exam every month and a breast X ray every 1-2 years for those 40-49; every year for those 50 and over. For uterine cancer, a pelvic exam every year, a Pap test at least every three years (after two negative tests a year apart), and an endometrial tissue sample at menopause, if at risk. For colon and rectum cancer, a digital rectal exam every year after 40, and a stool blood test every year after 50 as well as a procto exam every 3-5 years after two initial negative tests one year apart.

Some people are at higher risk for certain cancers and may need to have tests more frequently. See individual cancer sites sections (pp. 9-13) for high risk factors.

CANCER CONTROL

PUBLIC EDUCATION

The American Cancer Society has a strong and long-standing commitment to educating the public about ways of preventing or reducing the risk of developing cancer. Because each year thousands of lives could be saved through cancer prevention, risk reduction and early detection practices, the Society's Public Education programs are designed to inform people about cancer, tell them what they can do to protect themselves, and demonstrate related health habits and lifestyles.

The Society places utmost priority on the importance and value of periodic, cancer-related checkups and specific cancer tests, as well as prompt action in the event that one of cancer's seven warning signals occurs.

Six cancer sites offer the greatest opportunity for the prevention or cure of cancer: colon and rectum, lung, breast, uterus, oral cavity and skin. These sites account for the majority of cancer cases and about half of all cancer deaths. The Society's Public Education planning strategy places emphasis on the first four of these six sites where prevention, risk reduction and early detection practices realize the greatest return in terms of lives saved.

Educating the Young and Old

ACS Public Education programs are divided into two major audience categories: adults and youth. Adults are reached through the workplace, clubs and organizations, at home and in neighborhoods, and through programs with other health agencies. Programs for adults are carried out in small group settings or on a one-to-one basis, involving two-way communication and interaction. Whenever possible, volunteers are selected on the basis of skills that can be readily adapted to Society work, such as ex-smokers with group experience who can help in smoking cessation programs, and nurses who can teach breast self-examination to groups of women. The Society reinforces its Public Education messages with a variety of films, filmstrips, pamphlets and posters.

Youth programs are organized according to school grade: kindergarten through 6th; 7th through 9th; and 10th through 12th. These programs teach young people good health habits, help them make healthful lifestyle decisions and understand health behavior as it relates to cancer. Youth programs are most often carried out in the nation's classrooms. ACS materials in kit or package form are made available at no charge to school personnel and are used to complement existing curricula or as a basic introduction to healthy lifestyles. Computer software materials are also available for students' independent learning.

Reaching More People

In 1984-85, American Cancer Society Public Education programs, carried out at local levels, reached 15 million

adults and 29 million young people for a total of 44 million.

In the decade of the 1980's, the Society, as its goals, hopes to encourage more Americans to have tests for colorectal cancer, reduce the number of smokers, and increase the number of women who practice monthly breast self-examination, get Pap tests and have endometrial tissue samples taken. To help achieve its education objectives and priorities, the Society has launched a number of new programs including "Taking Control," a 10-step guide to a healthy life of reduced cancer risk; a "Smoke-Free Young America by the Year 2000" initiative; and a new educational emphasis on breast cancer detection and awareness.

In addition to the Society's intensive, person-to-person educational outreach, broader ACS programs blanket the nation with lifesaving messages. During the Society's annual door-to-door fund-raising Crusade, volunteers make personal home visits, informing individuals on how to protect themselves against cancer.

Overall, the Society distributes more than 60 million educational leaflets each year, and important cancer educational messages reach nearly every U.S. household through television, radio and the print media.

PROFESSIONAL EDUCATION

ACS Professional Education programs bring the latest developments in cancer to the medical community: members and students of the medical, dental, nursing and allied health professions.

Professional Education's National conferences, clinical fellowships, materials, professorships and scholarships provide information and training in the prevention and early detection of cancer, and in the treatment and rehabilitation of cancer patients. Its involvement in such Division and Unit programs as the Colorectal Health Check and the Great American Smokeout, are part of the overall ACS Professional Education effort.

Audiovisuals, Journals

Videotapes, films, slide sets, audiotapes, publications and exhibits are also available for Professional Education programs in hospitals as well as in medical, dental and nursing schools, and are used by professional societies at local and national meetings. The videocassettes and slide sets are distributed through ACS Divisions and Units on a free loan, five-year lease or direct sale basis.

The ACS publishes *Ca-A Cancer Journal for Clinicians*, which is directed particularly to the primary care physician and has a total circulation of more than 470,000. The Society supports the publication of *Cancer*, directed to those specializing in the care of the cancer patient.

Nursing Programs

Cancer Nursing News is sent to about 90,000 nurses. It keeps nurses up-to-date on cancer, oncology nursing, the American Cancer Society, and opportunities in continuing education. The newsletter is sent free to any nurse; requests for subscriptions should be sent to the Executive Editor, *Cancer Nursing News*, c/o American Cancer Society, 4 West 35th St., New York, NY 10001.

In 1981 the Society initiated a program of nursing scholarships. Twenty one-year scholarships are awarded each year to qualified graduate students studying for a master's degree with a specialty in cancer nursing. The recipients may apply for a second year's funding.

Another recently launched program, "Clinical Professorships in Oncology Nursing," provides a means for ACS Divisions to support selected individuals who will develop high quality cancer teaching programs within schools of nursing.

Clinical Oncology Awards

Since 1948, the ACS National Clinical Fellowship program has spent more than $40 million to train some 7,400 physicians and dentists in the diagnosis and treatment of cancer. Training has been provided on two levels at centers and hospitals with qualified training programs.

The Regular Clinical Fellowship program — for hospital residents — is designed to improve the management of the patient with cancer by supporting clinical oncology training for young physicians and dentists.

The Society awards Clinical Oncology Career Development Awards to some outstanding individuals who have demonstrated a commitment to pursue an academic career in oncology.

During 1985-86, training will be supported for 348 Regular Clinical Fellows and 46 Career Development Awards.

The Clinical Fellowship program has been extremely successful in achieving its goal of increasing the number of highly qualified oncologists providing cancer care. In the future, the emphasis of the program will be on developing *academic* oncologists who will acquire both clinical oncology expertise and the ability to perform independent clinical oncology research.

Unproven Methods of Cancer Management

The American Cancer Society maintains information on unproven methods of cancer management. This information is reviewed in-depth and is issued in position statements. These statements are available on request to physicians, science writers, editors and the general public, to assist in evaluating claims made for unproven methods of cancer prevention, detection, diagnosis and treatment.

The Society welcomes new developments which have been proven scientifically effective and safe in the prevention, detection, diagnosis or treatment of cancer.

SERVICE AND REHABILITATION

In 1985, over one half million cancer patients were reached through the innovative service and rehabilitation programs of the American Cancer Society. Because of the many volunteers at the Division and Unit levels, the Society is able to offer a wide range of services encompassing:

1. Information and guidance services which provide specific information about cancer as well as referral to Society services and other resources in the community to meet the social, psychological and home care needs of cancer patients and their families;
2. Home care items for use by patients;
3. Transportation of cancer patients, assisting them in getting to and from medical and therapy appointments;
4. Rehabilitation programs helping patients return to their families, communities and occupations through carefully trained and selected visitor and group programs;
5. Patient/family education programs to provide a better understanding of the disease and its management through group education programs, pamphlets, booklets and audiovisual presentations.

Rehabilitation Programs

CanSurmount is a short-term visitor program for patients, and the families of patients, with many types of cancer. Hospital and home visits are made with the approval and awareness of the physician. The one-to-one visit by a person who has experienced the same type of cancer offers functional, emotional and social support.

Reach to Recovery is the largest of the Society's patient visitor programs. It addresses the many needs of women who have/have had breast cancer. Carefully selected and trained volunteer visitors provide support and information, with the approval of the attending physician. The program is designed to help women meet the physical, emotional, and cosmetic needs related to their disease and/or its treatment. In addition, literature and services to help husbands, children and friends of breast cancer patients are available.

Laryngectomy Rehabilitation Program, spearheaded by The International Association of Laryngectomees (IAL), brings the message that a laryngectomee can return to a normal life. Coordinated through more than 325 clubs, laryngectomee visitors, who themselves have had their larynxes (voice boxes) removed because of cancer, provide pre and/or postoperative support to patients who have recently undergone the laryngectomy operation.

Ostomy Rehabilitation Program — Some patients with intestinal or urinary cancers must have abdominal ostomies (surgically constructed openings for elimination of bodily wastes). Trained volunteers who have experienced this same type of surgery offer help on a one-to-one basis. Cooperating with the United Ostomy Association and enterostomal therapists, patients are assisted in their physical and psychological adjustment.

Patient and Family Education

The Society sponsors group and individual education programs, distributes pamphlets and booklets for an individual's use, and provides audiovisual presentations for patients of all ages and their families to help them understand, and deal with the complexities of the disease. Group programs such as *I CAN COPE* provide information on cancer therapy, treatment, side effects, nutrition, resource availability and other topics of interest to cancer patients and their families.

Other Programs

Home Care Items — A program providing necessary, useful home care supplies, equipment, dressings and gifts for the comfort and recreation of the patient.

Transportation — Through the efforts of volunteer drivers in programs such as Road to Recovery, cancer patients receive transportation for diagnosis, treatment, rehabilitation and continuing care.

COSTS OF CANCER

A study by the National Center for Health Statistics (NCHS) puts overall medical costs for cancer at $10.8 billion for 1980. Because medical care costs have been inflating at 20% or more a year, that figure could easily have more than doubled by now.

In the NCHS study, 67% of the total amount was spent for hospital care, 23% for physicians' services, 5% for drugs, 4% for nursing home care, and 1% for other professional services.

A study by the Blue Cross and Blue Shield Association estimates that the average American who died of cancer in 1983 ran up more than $22,000 in medical bills during the final year of life. The study, based on cases in Michigan, Indiana and Georgia, was funded by the U.S. Health and Human Services Department.

Individuals have several sources of help in paying for cancer costs: third-party payers such as Blue Cross and private insurance companies, public agencies and private health organizations. Cancer is covered by personal insurance plans either under narrowly defined cancer policies or through catastrophic illness provisions in comprehensive insurance programs.

The Third National Cancer Survey showed that for patients under 65 years, Blue Cross and private insurers were the source of payment in over 77% of the cases. For patients over 65, Medicare paid expenses in nearly 88% of the cases.

30-YEAR TRENDS IN AGE-ADJUSTED CANCER DEATH RATES PER 100,000 POPULATION 1950-52 to 1980-82

SITES	SEX	1950-52	1980-82	PERCENT CHANGES	COMMENTS
ALL SITES	Male	169.8	216.0	+ 27	Steady increase mainly due to lung cancer.
	Female	146.7	135.4	− 8	Slight decrease.
BLADDER	Male	7.2	6.5	*	Slight fluctuations; overall no change.
	Female	3.1	1.9	− 39	Some fluctuations; noticeable decrease.
BRAIN	Male	3.5	4.7	+ 34	Steady slight increase in both sexes; reasons unknown.
	Female	2.3	3.2	+ 39	
BREAST	Male	0.3	0.2	*	Constant rate.
	Female	25.9	26.6	+ 3	Slight fluctuations; overall no change.
COLON & RECTUM	Male	25.8	25.3	*	Slight fluctuations; overall no change.
	Female	24.9	18.0	− 28	Slight fluctuations; noticeable decrease.
ESOPHAGUS	Male	4.7	5.5	+ 17	Some fluctuations; slight increase.
	Female	1.2	1.5	*	Slight fluctuations; overall no change in female.
KIDNEY	Male	3.3	4.8	+ 45	Steady slight increase.
	Female	2.0	2.2	*	Slight fluctuations; overall no change.
LEUKEMIA	Male	7.7	8.7	+ 13	Early increase, later leveling off and decrease.
	Female	5.3	5.1	*	Slight early increase, later leveling off.
LIVER	Male	6.7	4.7	− 30	Some fluctuations. Steady decrease in both sexes.
	Female	7.7	3.5	− 55	
LUNG	Male	23.7	72.1	+ 204	Steady increase in both sexes due to cigarette smoking.
	Female	4.9	29.9	+ 510	
ORAL	Male	6.1	5.3	*	Slight fluctuations; overall no change in both sexes.
	Female	1.5	2.3	*	
OVARY	Female	8.1	7.9	− 2	Steady increase, later leveling off and decrease.
PANCREAS	Male	8.4	10.5	+ 25	Steady increase in both sexes, then leveling off. Reasons unknown.
	Female	5.5	7.0	+ 27	
PROSTATE	Male	20.7	22.8	+ 10	Fluctuations throughout; overall slight increase.
SKIN	Male	3.2	2.7	*	Slight fluctuations; overall no change in both sexes.
	Female	2.0	1.4	*	
STOMACH	Male	23.6	8.1	− 66	Steady decrease in both sexes; reasons unknown.
	Female	12.8	3.8	− 70	
UTERUS	Female	20.7	7.6	− 63	Steady decrease.

*Percent changes not listed because they are not meaningful.

RESEARCH

THE ACS AND RESEARCH

The American Cancer Society is one of the largest sources of cancer research funds in the United States, second only to the National Cancer Institute, an agency of the Federal government.

The Society's overall investment in research each year has grown steadily from $1 million in 1946 to nearly $67 million* today. This sum represents nearly a third of the total ACS budget. To date, the Society has invested more than half a billion dollars in cancer research.

The research program focuses primarily on investigator initiated projects, rather than directed research undertaken on a contract basis. With the exception of staff and facilities to carry out its epidemiological studies, the ACS neither hires staff researchers nor operates its own laboratories. This gives the Society the freedom to place its grants where innovative and promising ideas are being explored.

A key factor in the role of the Society in cancer research is providing qualified scientists with alternative funding sources to carry on their work. The Society believes it can make the most effective use of its research funds by supporting scientists working in established medical institutions across the country. In this way there is a minimum of overhead and a maximum of flexibility to make sure that research money has the highest probability of yielding results that will benefit people.

Applications for ACS grants are put through a rigorous process of evaluation, beginning with careful study by the appropriate one of 11 scientific review committees and two additional groups of experts. It must be given final approval by the National Board of Directors.

Kinds of Grants

The Society's research program is diverse in concept and recipients. It provides support both for established scientists and those starting out on their own independent research. It funds postdoctoral training for promising young investigators and stimulates new ideas in cancer research among those working in universities, institutes and teaching hospitals.

Overall, the program offers five types of grants: (1) Research and Clinical Investigation Grants to finance investigator-initiated research; (2) Institutional Research Grants to universities, institutes and hospitals to support pilot studies and the work of young investigators in cancer; (3) Research Personnel Grants to outstanding scientists and students specializing or planning to specialize in cancer research; (4) Research Development Programs to provide rapid funding for priority projects; and (5) Special Institutional Grants for Cancer Cause and Prevention Research to provide longer term funding.

Research Professorships. The Research Professorship grant program, unique in the field, has been in existence since 1957. The Society supports 24 of the nation's most gifted scientists through retirement. These are people devoting their life's work to cancer research. Freed of major administrative responsibilities and other restrictions, they can concentrate on their fields of scientific investigation.

Physicians' Research Training Fellowships. Unique in the research world, this type of Research Personnel Grant was inaugurated in 1981 because of a dearth of MD's in the research field. It provides an opportunity for physicians to take two years from their medical careers to train as researchers.

Research Development Program. Established to identify and provide rapid funding for high priority projects, approved applications can be funded in less than three months. This compares with the 10 to 18 months required by the Federal government before a new application can be funded.

The kinds of research projects eligible under the Research Development Program include: (1) unique research opportunities which cannot wait for the normal lengthy funding procedures; (2) unanticipated needs relating to research already under way; (3) program coordination, especially that involving clinical trials and the dissemination of research results to community hospitals; and (4) program integration between the American Cancer Society and other health organizations.

All applications are evaluated for — among other considerations — merit, qualifications and productivity of the investigator; relevance, need for rapid funding, and probability of the project's eventual contribution to cancer control. More than $12 million has been appropriated so far to the Research Development Program, over half of which has been for interferon research.

Interferon Research. Interferon, a natural body protein, was discovered as an antiviral agent and later found to have some anticancer activity. In 1978, the Society invested an unprecedented $2 million to purchase interferon for clinical trials. The substance was extremely scarce and expensive, since it was obtained from human blood cells.

So far, a number of patients have shown some response to interferon, ranging from those whose steady downhill course was stabilized, to those whose tumors disappeared entirely. It is still too early to tell what the long-term effects will be.

In working with interferon, scientists discovered that there are at least three different types, each produced by different cells, and potentially capable of different activity. Large quantities of interferon now can be produced using the techniques of recombinant DNA. It is far cheaper and purer than the original human blood substance.

For many years only a relatively small amount of research with animal interferons was conducted because of the limited availability of non-human interferons. Interferons are highly species specific and must be produced by the same animal species (or its tissue cultures) for which it will be used experimentally. With the production of suf-

*Subject to audit

ficient amounts of mouse interferons, the Society in mid-1984 allocated $1.5 million for an animal interferon program, designed to guide improvements in the beneficial use of interferons in human cancer. Initial projects in the new program include: dose optimization determinations, combination therapy trials of interferons and hyperthermia, of interferons and monoclonal antibodies in lymphoma, and interferons and a chemotherapeutic agent in bladder tumor. Additional projects are under review for implementation.

In early 1980 the Society allocated an additional $4.8 million for interferon research which in part permitted a study to be conducted using a different type of interferon, one produced by fibroblast cultures. This interferon is being studied at 12 institutions in advanced prostate cancer, glioblastoma multiforme and soft tissue sarcomas.

Ultimately, interferon may be valued not so much for itself, as for its role in heralding a whole new class of compounds called "biologic response modifiers," which will fight cancer by stimulating the body's immune system.

ACS Research in the 80's

In addition to ongoing interferon studies, ACS-funded researchers will continue to investigate broad areas of cancer research in the coming decade. For example, they will be exploring:

Genetic engineering. One method in this new technology, recombinant DNA (gene splicing) is already being used to produce interferon. It has among its potential uses the manufacture of powerful new drugs, correcting impaired immune systems, even modifying heredity by transplanting foreign genes. It is hoped that the process will yield other anticancer activities.

Man-made antibodies such as hybridomas (antibody factories) and highly specific monoclonal antibodies can be produced that will recognize cancer cells only, and thus be able to detect cancer early, when the disease is most curable, before clinical signs appear. Monoclonal antibodies already have been used to deliver drugs directly to tumors, killing them but sparing healthy issue, i.e., a rifle instead of a shotgun.

Mechanisms of carcinogenesis. Investigators are approaching these key questions from many angles. One model, as found in animals, shows that cancer in humans develops in a two-step process — initiation and promotion. Other questions include: Are there proto-oncogenes, normal genes, serving as master switches for early tissue development, which induce normal cells to become cancerous later in life? If so, what turns them on? Can they be programmed to stay off? Do viruses, already known to cause cancer in animals, also cause cancer in humans, perhaps by activation of these proto-oncogenes?

Chemoprevention. People can be protected from cancer by what they eat or drink, or by other substances or lifestyles that serve as defense mechanisms. Clues are being pursued by ACS researchers studying such agents as vitamin A; retinoids (synthetic forms of vitamin A); vitamin C; vitamin E; the chemical element selenium, found in the soil; and by other naturally occurring substances in brussels sprouts, cabbage, etc.

Still other ACS investigators are looking for ways to detect cancer earlier by tracing a cell's biochemical markers. They are exploring evidence that the outbreak of the rare skin cancer, Kaposi's sarcoma, is linked to a breakdown in the individual's immune system. And they are testing the hypothesis that certain chemicals enhance a tumor's receptivity to radiation therapy.

The Financial Research Picture

In fiscal 1985, the ACS made 712 grants to major institutions in this country and to scientists working here and abroad. The total amount, subject to audit, was nearly $64 million. This does not include some $3 million granted directly by ACS Divisions. The following table — covering the years 1982 to 1985 inclusive — lists the number of applications received, the total number of dollars required, and those actually funded by the ACS National Office.* ACS allocated its funds to effectively carry out its three-pronged attack against cancer: Research, Education and Service.

	Requested		Funded	
Year	Number	Amount	Number	Amount
1982	2,475	300,961,755	681	53,953,831
1983	2,564	336,760,146	646	54,132,563
1984	2,247	290,368,552	674	57,775,330
1985	2,096	273,968,261	755	67,024,222

CANCER AND THE ENVIRONMENT

Most cancer cases in the United States are believed to be environmentally related, that is, associated in some way with our physical surroundings, personal habits or lifestyles.

Occupational hazards, although associated with only a small percentage of cancers, are under close surveillance. Virtually every suspected major chemical and other substance in the workplace presumed to be a health risk is under investigation. Each study can require years and hundreds of thousands of dollars to complete.

Some environmental causes of cancer are well known. About 30% of all cancers are directly related to the use of tobacco, either alone or in conjunction with excessive consumption of alcohol.

Other causes are harder to determine. Diet is suspected as an important element in cancer risk, some say as much as 35% of all cancer deaths. There is much research underway on the role diet and nutrition play in the development of cancer.

To help identify environmental factors in human cancer, the American Cancer Society has undertaken a three-part program of environmental cancer research. This involves (1) Cancer Prevention Study II, an epidemiologic study to examine the relationship of environment and lifestyle to cancer development; (2) studies of groups exposed to industrial substances suspected of causing cancer; and (3) support of extramural cancer cause and prevention research projects.

*Subject to audit

The American Cancer Society's Cancer Prevention Study II

One of the largest research studies ever carried out in the United States was launched in 1982. Cancer Prevention Study II, a long-term prospective study, is examining the habits and exposures of more than one million Americans to learn how lifestyles and environmental factors affect the development of cancer.

Modeled after the first ACS Cancer Prevention Study (1959-72), CPS-II is similar in method but wider in scope and involves more participants.

Over 77,000 volunteers enrolled 1.2 million men and women in the study. These volunteer researchers distributed a four-page confidential questionnaire to participants who were asked about their exposures to certain environmental conditions, their history of disease and their lifestyles. The questionnaires were designed to elicit more than 500 pieces of information each, which was computerized for statistical analysis.

Many of the questions focus on health issues of current concern. These include risks of certain drugs, foods and various occupational exposures; low-tar and nicotine cigarettes; consumer products; long-term exposure to low-level radiation; and the health effects associated with air and water pollution.

For a period of six years, and possibly longer, the volunteers will keep track of the status and whereabouts of study participants. Various suspected relationships will be tested by comparing mortality rates of differently exposed groups.

The goal of the study is to identify those factors that increase a person's chances of developing cancer, those that carry little or no risk, and those that actually may help prevent cancer.

The Society's first Cancer Prevention Study resulted in important findings about health and disease. Study data provided overwhelming evidence that cigarette smoking is the major cause of lung cancer and an important factor in other cancers. It also furnished information on risks of heart disease and other serious illnesses, and revealed a relationship between obesity and certain cancers.

Since the first study, new factors in our environment have been identified that may be related to cancer. The Society decided to initiate a second study to respond to the concerns of the public and scientific community about suspected carcinogens.

Without the use of ACS volunteers, the cost of carrying out CPS II would total more than $100 million. With volunteers to collect the data, the study is estimated to cost only about $9 million to complete.

Studies of Occupational Groups

A number of studies of union workers exposed to various agents have been undertaken in the Society's Intramural Research Program; the findings will have considerable public health implications.

It has been established that asbestos workers have a high risk of lung cancer, gastrointestinal cancer and other conditions. Less clear, though, is the hazard asbestos exposure poses for the general population, particularly among people exposed to very low levels.

The ACS is studying the mortality of family members of asbestos factory workers and insulation workers to determine if they are at an increased risk of lung cancer and other asbestos-related diseases. A study of shipyard workers will offer data on this group's cancer incidence and mortality rates.

In a current study, it may be learned how smoking cessation affects the lung cancer risk of insulation workers who no longer work with asbestos materials.

Other occupational groups under continuing investigation include vinyl chloride workers, painters, rubber plant employees, those who work with polychlorinated biphenyls (PCB's), printing press workers, and health care and hospital employees.

Special Institutional Grants

As part of its continuing program to provide substantial and relatively long-term support for major institutions engaged in cancer cause and prevention research, the American Cancer Society awarded continuing grants to the following institutions in 1985:

- Institute of Environmental Medicine, New York University Medical Center, New York, N.Y., to conduct a broad spectrum of studies dealing with such subjects as DNA interactions, risk assessment and nutrition.
- Massachusetts Institute of Technology, Boston, Mass., to use innovative techniques to detect changes in DNA, hemoglobin and albumin, and changes in T-cells that could signal relatively low exposures to carcinogens; together with the Harvard School of Public Health for biochemical studies of cancer risks, involving such groups as smokers, nonsmokers and those with particular dietary habits.
- Milton Hershey Medical Center, Pennsylvania State University, Hershey, Pa., to research the cause, course and prevention of metastatic tumor growth.
- The American Health Foundation, New York, N.Y., to conduct epidemiologic studies, health behavior evaluations, and biochemical analyses of various consumer products.
- Temple University School of Medicine, Philadelphia, Pa., for an ongoing study of cancer prevention and analyses of chemical and environmental carcinogens.
- Memorial Sloan-Kettering Cancer Center, New York, N.Y., to identify candidates at high risk of colorectal cancer.
- University of Minnesota, Minneapolis, for a study of inhibitors of carcinogenesis found in diet.
- The Johns Hopkins University School of Medicine, Baltimore, Md., to develop new methods of protecting against cancer-causing influences, with special emphasis on the hazards of medical drugs.
- The University of Southern California School of Medicine, Los Angeles, to study the possible relationship of cancer to specific occupational, drug or other environmental exposures.

SUMMARY OF RESEARCH GRANTS & FELLOWSHIPS AWARDED BY ACS (National Society & Divisions) DURING THE FISCAL YEAR ENDED AUGUST 31, 1985 (Subject to Audit)

Alabama, Univ. of, Birmingham	(4)	$ 341,180.00
Arizona Univ., Tucson	(1)	45,000.00
Basel, Univ. of, Switzerland	(1)	43,200.00
Baylor Coll. of Medicine, Houston, TX	(5)	468,998.00
Beth Israel Hosp., Boston, MA	(3)	284,559.00
Boston Univ., Boston, MA	(4)	205,785.00
Bowling Green State Univ., OH	(1)	125,000.00
Brandeis Univ., Waltham, MA	(6)	372,445.00
Brigham and Women's Hosp., Boston, MA	(2)	220,187.00
Brown Univ., Providence, RI	(4)	302,418.00
California Inst. of Tech., Pasadena, CA	(9)	563,282.00
California, Univ. of (various locations)	(61)	5,499,130.00
Cambridge Univ., England	(1)	33,200.00
Carnegie Inst. of Washington, Baltimore, MD	(2)	51,200.00
Carnegie-Mellon Univ., Pittsburgh, PA	(2)	57,100.00
Case Western Reserve Univ., Cleveland, OH	(3)	235,071.00
Catholic Univ. of America, Washington, DC	(1)	118,381.00
Chicago, Univ. of, IL	(11)	930,761.00
Children's Cancer Res. Fdn., Boston, MA	(2)	143,351.00
Children's Hosp. of Philadelphia, PA	(3)	122,699.00
Children's Hosp. Medical Ctr. of Northern Calif., Oakland	(1)	90,000.00
Cincinnati, Univ. of, OH	(5)	413,807.00
City Coll. of the City Univ. of New York	(1)	140,000.00
City of Hope Nat'l Med. Ctr., Duarte, CA	(1)	78,750.00
Clark Univ., Worcester, MA	(1)	44,354.00
Cold Spring Harbor Lab, NY	(5)	301,000.00
Coll. of Medicine and Dentistry of New Jersey	(1)	31,000.00
Colorado State Univ., Fort Collins	(1)	120,000.00
Colorado, Univ. of, Boulder	(15)	1,049,081.00
Columbia Univ., New York, NY	(9)	1,895,789.00
Comprehensive Ca. Ctr. of Metro. Detroit, MI	(1)	50,000.00
Connecticut, Univ. of, Storrs	(6)	763,057.00
Cornell Univ., Ithaca, NY	(3)	347,691.00
Cornell Univ., New York, NY	(3)	308,931.00
Dartmouth Coll., Hanover, NH	(5)	266,344.00
Duke Univ., Durham, NC	(5)	480,144.00
Duquesne Univ., Pittsburgh, PA	(1)	90,931.00
Emory Univ., Atlanta, GA	(1)	165,000.00
European Molecular Biol. Lab., Heidelberg, W. Germany	(1)	42,500.00
Florida, Univ. of, Gainesville	(5)	338,656.00
Fred Hutchinson Cancer Res. Ctr., Seattle, WA	(7)	392,932.00
Frederick Cancer Res. Ctr., Frederick, MD	(1)	16,000.00
George Washington Univ., Washington, DC	(1)	39,374.00
Georgetown Univ., Washington, DC	(4)	321,970.00
Hahnemann Med. Coll., Philadelphia, PA	(1)	10,000.00
Harvard Sch. of Pub. Health, Boston, MA	(2)	287,696.00
Harvard Univ., Boston, MA	(16)	1,226,394.00
Hawaii, Univ. of, Honolulu	(2)	84,375.00
Illinois, Univ. of, Urbana	(2)	158,183.00
Indiana, Univ. of, Bloomington	(1)	50,577.00
Inst. de Recherches Scientifique sur le Cancer, France	(1)	92,560.00
Inst. for Cancer Res., Philadelphia, PA	(6)	278,291.00
Inst. Pasteur, France	(1)	42,000.00
Iowa State Coll., Ames	(1)	160,000.00
Iowa, State Univ., of, Iowa City	(5)	526,498.00
Jackson Laboratory, Bar Harbor, ME	(3)	304,567.00
Jewish Hosp. of St. Louis, MO	(1)	151,060.00
Johns Hopkins Univ., Baltimore, MD	(14)	$2,222,406.00
Kansas State Univ., Manhattan	(1)	147,814.00
Kansas, Univ. of, Lawrence	(3)	263,271.00
Kentucky, Univ. of, Lexington	(4)	311,003.00
La Jolla Cancer Res. Fdn., La Jolla, CA	(1)	48,274.00
Lankenau Hosp., Philadelphia, PA	(1)	25,000.00
Lehigh Univ., Bethlehem, PA	(2)	249,955.00
Louisiana State Univ., Baton Rouge	(5)	310,250.00
Louisville, Univ. of, Louisville, KY	(1)	100,000.00
Maryland, Univ. of, Baltimore	(4)	359,500.00
Massachusetts General Hosp., Boston	(1)	84,525.00
Massachusetts Inst. of Technology, Cambridge	(11)	919,371.00
Massachusetts, Univ. of, Amherst	(3)	258,304.00
Medical Biology Inst., La Jolla, CA	(2)	230,770.00
Medical Coll. of South Carolina, Charleston	(1)	115,100.00
Medical Fdn. of Buffalo, Inc., Buffalo, NY	(1)	155,000.00
Medical Res. Council, England	(1)	34,000.00
Miami, Univ. of, Coral Gables, FL	(2)	252,679.00
Michigan State Univ., East Lansing	(1)	90,500.00
Michigan, Univ. of, Ann Arbor	(10)	1,087,852.00
Minnesota, Univ. of, Minneapolis	(7)	626,629.00
Missouri, Univ. of, Columbia	(1)	150,000.00
Montefiore Hosp., New York, NY	(1)	215,225.00
Mount Sinai Sch. of Medicine, New York, NY	(6)	751,749.00
Nat'l Acad. of Sciences, Washington, DC	(1)	36,000.00
Nat'l Cancer Inst., Lab. of Molecular Biol., Bethesda, MD	(1)	16,000.00
Nat'l Cancer Inst., Immunology Branch, Bethesda, MD	(1)	41,000.00
Nat'l Heart and Lung Inst., Bethesda, MD	(1)	41,000.00
Nat'l Inst. of Allergy and Infectious Diseases, Bethesda, MD	(2)	73,420.00
Nat'l Inst. of Child Health and Human Development, Bethesda, MD	(1)	41,050.00
Nat'l Jewish Hosp. and Res. Ctr., CO	(3)	313,890.00
Nat'l Soc. for Med. Res., Washington, DC	(1)	10,000.00
Nebraska, Univ. of, Omaha	(1)	50,000.00
New England Deaconess Hosp., Boston, MA	(1)	29,167.00
New Jersey Med. Sch., Newark	(1)	160,000.00
New Mexico, Univ. of, Albuquerque	(3)	214,250.00
New York State Psychiatric Inst.	(1)	10,000.00
New York Univ., New York, NY	(7)	635,323.00
North Carolina, Univ. of, Chapel Hill	(8)	707,393.00
Northwestern Univ., Chicago, IL	(1)	10,000.00
Oak Ridge Assoc. Univs. Inc. Oak Ridge, TN	(1)	92,584.00
Ohio State Univ., Columbus	(3)	268,720.00
Oregon Health Sciences Univ., Portland	(2)	108,750.00
Oregon State College, Corvallis	(4)	279,226.00
Oregon, Univ. of, Eugene	(4)	606,400.00
Pacific Northwest Res. Fdn., Seattle, WA	(1)	87,600.00
Pennsylvania State Univ., University Park	(4)	215,000.00
Pennsylvania, Univ. of, Philadelphia	(8)	477,096.00
Peralta Hosp. Assoc., Oakland, CA	(1)	228,223.00
Pittsburgh, Univ. of, Pittsburgh, PA	(3)	279,000.00
Princeton Univ., Princeton, NJ	(11)	869,264.00
Pub. Health Res. Inst., New York, NY	(2)	250,000.00
Purdue Univ., Lafayette, IN	(3)	215,000.00
Rochester, Univ. of, Rochester, NY	(4)	269,706.00
Rockefeller Univ., New York, NY	(11)	1,187,854.00
Roger Williams General Hosp., Providence, RI	(2)	120,110.00
Roswell Park Memorial Inst., Buffalo, NY	(13)	$1,257,736.00
Rutgers State Univ. of New Jersey, New Brunswick	(2)	97,616.00
Salk Inst. for Biological Studies, San Diego, CA	(4)	198,312.00
Scripps Clinic Res. Fdn., La Jolla, CA	(8)	628,584.00
Showa Univ. Res. Inst. for Bio-Medicine, St. Petersburg, FL	(1)	160,000.00
Sidney Farber Cancer Ctr., Boston, MA	(11)	997,074.00
Sloan-Kettering Inst. for Cancer Res., New York, NY	(24)	2,064,836.00
Sloan-Kettering Inst., Westchester, NY	(1)	150,000.00
South Carolina, Univ. of, Columbia	(2)	235,000.00
South Florida, Univ. of, Tampa	(1)	160,000.00
Southern California, Univ. of, Los Angeles	(5)	1,391,161.00
Southern Res. Inst., Birmingham, AL	(1)	92,544.00
St. Jude Children's Res. Hosp., Memphis, TN	(3)	337,521.00
St. Louis Univ., St. Louis, MO	(2)	218,074.00
Stanford Univ., Stanford, CA	(28)	1,833,040.00
State Univ. of New York, Downstate, Brooklyn	(2)	177,500.00
State Univ. of New York, Stony Brook	(8)	524,146.00
State Univ. of New York, Syracuse	(1)	160,000.00
Syracuse Univ., Syracuse, NY	(1)	22,300.00
Temple Univ., Philadelphia, PA	(3)	177,577.00
Texas Tech. Univ. Health Sciences Ctr.	(1)	155,000.00
Texas, Univ. of (various locations)	(32)	4,213,710.00
Tufts New England Med. Ctr., Boston, MA	(2)	131,500.00
Tufts Univ., Medford, MA	(8)	671,997.00
Tulane Univ., New Orleans, LA	(2)	167,238.00
Université Louis Pasteur, France	(1)	42,000.00
University Hosp., Boston, MA	(1)	99,750.00
Univ. of Toronto, Canada	(2)	82,240.00
Univ. of Vermont Reg. Cancer Ctr., Burlington	(1)	35,000.00
Univ. of Wyoming, Laramie	(1)	63,000.00
Uppsala Univ., Sweden	(1)	16,318.00
Utah, Univ. of, Salt Lake City	(2)	137,118.00
Vanderbilt Univ., Nashville, TN	(4)	187,742.00
Vermont, Univ. of, State Agr. Coll., Burlington	(4)	208,021.00
Veterans Admin. Ctr., East Orange, NJ	(1)	10,000.00
Virginia Mason Res. Ctr., Seattle, WA	(1)	110,360.00
Virginia, Med. Coll. of, Richmond	(3)	200,981.00
Virginia, Polytechnic Inst. and State Univ. of, Blacksburg	(1)	68,497.00
Virginia, Univ. of, Charlottesville	(6)	472,848.00
Wake Forest College, Winston-Salem, NC	(2)	173,750.00
Washington State Coll. of, Pullman	(1)	225,000.00
Washington State Univ., Pullman	(2)	235,000.00
Washington, Univ. of, Seattle	(12)	997,065.00
Washington Univ., St. Louis, MO	(3)	135,444.00
Wayne State Univ., Detroit, MI	(2)	222,821.00
Whitehead Inst. Bio-Med. Res., Cambridge, MA	(7)	677,000.00
Wisconsin, Univ. of, Madison	(7)	481,563.00
Wistar Inst. of Anat. and Bio., Philadelphia, PA	(6)	742,562.00
Worcester Fdn. for Experimental Bio., Shrewsbury, MA	(1)	55,000.00
Yale Univ., New Haven, CT	(22)	1,684,970.00
Yeshiva Univ., Bronx, NY	(17)	1,367,573.00
Professional Programs of the UICC	(2)	615,000.00
SUBTOTAL	(712)	63,703,751.00
Division Research Grants	(1)	3,000,000.00
TOTAL	(713)	66,703,751.00

NOTE: Numbers in parentheses indicate number of grants per institution for the year ended August 31, 1985; totals subject to audit.

THE AMERICAN CANCER SOCIETY

PROFILE

The American Cancer Society, Inc. is a national voluntary health organization of 2.5 million Americans united to conquer cancer through balanced programs of research, education, patient service and rehabilitation.

Organization: The American Cancer Society, Inc. is composed of a National Society, with 58 chartered Divisions and 3,242 Units.

The National Society: A 200-member House of Delegates provides a basic representation from the 58 Divisions and additional representation on the basis of population. It elects and is governed by a Board of Directors of 121 voting members, approximately half of whom are members of the medical or scientific professions.

The National Society is responsible for overall planning and coordination, and provides technical help and materials to Divisions and Units. The National Society administers programs of research, medical grants and clinical fellowships, and is charged with carrying out public and professional education on the national level.

The 58 Divisions: These are governed by 3,847 members of Divisional Boards of Directors, both medical and lay, in all the states plus six metropolitan areas, the District of Columbia and Puerto Rico.

The Units: These are organized to cover the 3,130 counties in the United States. There are thousands of community leaders who direct the Society's programs at this level. The basic strength of the Society lies in the loyal ranks of volunteers fighting cancer in their communities.

The Programs: The Society maintains its priorities and goals through activities developed by the departments of Research, Professional Education, Public Education, Public Information, Epidemiology and Statistics, Service and Rehabilitation, and Crusade.

CANCER'S SEVEN WARNING SIGNALS

1. Change in bowel or bladder habits
2. A sore that does not heal
3. Unusual bleeding or discharge
4. Thickening or lump in breast or elsewhere
5. Indigestion or difficulty in swallowing
6. Obvious change in wart or mole
7. Nagging cough or hoarseness

If you have a warning signal, see your doctor.

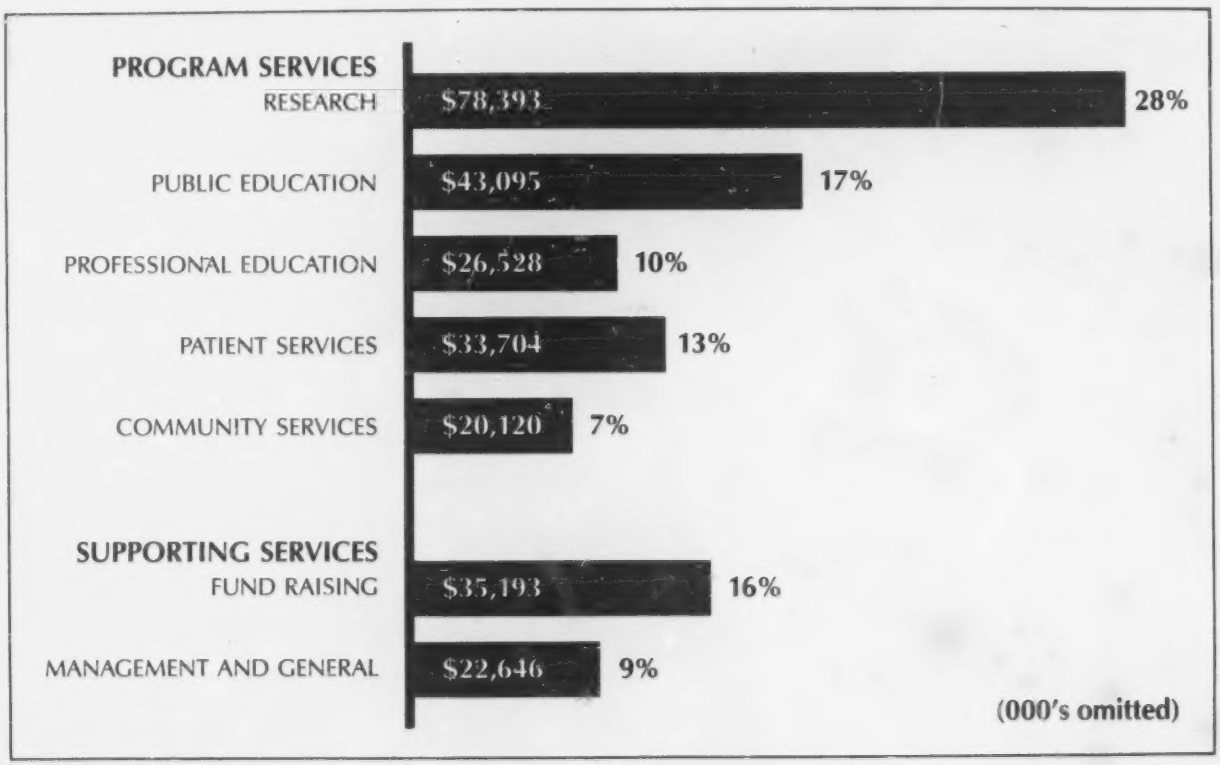
SOURCES OF INCOME

Financial support of the American Cancer Society in fiscal 1984 was over $220 million from public sources. The Cancer Crusade raised about $167 million. National Headquarters and chartered Divisions received some $53 million from bequests and legacies. The public has given generous and growing support to the Society over the years. In 1946, for example, funds raised exceeded $10 million. Thirty-five years later, in 1981, that figure had soared to more than $170 million.

Legacies — in which the Society becomes beneficiary of willed funds — are an increasingly important source of ACS income. Income from legacies indicates confidence in the leadership of the Society and a determination by many Americans to continue the fight against cancer even after their lifetimes. Legacy income in relation to Crusade receipts is shown below.

Year	Crusade	Legacies
1975	78,788,000	31,056,000
1976	84,882,000	33,968,000
1977	90,120,000	24,606,000
1978	95,928,000	30,179,000
1979	102,778,000	39,361,000
1980	113,325,000	41,366,000
1981	124,615,000	45,793,000
1982	135,197,000	47,800,000
1983	151,181,000	51,908,000
1984	166,998,000	53,530,000

ALLOCATION OF ACS FUNDS BASED ON TOTAL 1984-1985 BUDGET — $259,679,000



Figures taken from 1984 Annual Report

CANCER AROUND THE WORLD, 1980-1981

Age-Adjusted Death Rates Per 100,000 Population for Selected Sites for 47 Countries

COUNTRY	ALL SITES		ORAL		COLON & RECTUM		LUNG		BREAST	UTERUS	STOMACH		PROSTATE	LEUKEMIA	
	Male	Female	Male	Female	Male	Female	Male	Female	Female	Female	Male	Female	Male	Male	Female
United States*	215.9(21)	135.5(18)	5.6(13)	1.9(11)	25.1(17)	18.2(17)	71.6(9)	21.4(6)	26.6(15)	7.7(36)	8.2(45)	3.9(45)	22.7(14)	8.7(3)	5.2(10)
Australia*	217.3(19)	127.5(23)	5.1(20)	1.7(13)	26.9(10)	22.4(9)	65.1(17)	12.2(13)	23.6(19)	6.9(39)	14.6(38)	6.4(41)	22.7(14)	8.6(5)	5.3(9)
Austria	247.0(7)	150.4(9)	5.3(15)	0.8(40)	31.2(5)	21.1(10)	65.9(15)	9.7(17)	24.9(18)	14.3(12)	34.1(7)	16.7(9)	22.9(13)	7.3(19)	4.7(19)
Bahamas**	163.7(34)	94.6(39)	15.2(4)	1.4(22)	4.8(40)	6.2(37)	27.1(33)	1.4(45)	28.3(11)	5.9(44)	11.3(41)	11.1(21)	35.6(1)	NA	0.8(43)
Barbados	181.4(28)	124.9(26)	5.2(17)	0.7(43)	11.7(29)	13.1(23)	22.0(37)	4.3(38)	27.6(14)	22.5(2)	31.6(9)	10.5(24)	32.6(2)	4.7(34)	1.9(39)
Brazil*	50.5(45)	39.2(45)	2.6(36)	0.5(45)	2.4(41)	2.5(43)	7.5(43)	2.2(43)	5.3(43)	6.0(42)	9.0(42)	4.2(44)	3.7(42)	2.5(40)	2.0(38)
Bulgaria	153.8(36)	97.4(38)	2.5(37)	0.9(37)	15.1(26)	10.4(29)	42.9(25)	7.3(31)	15.1(29)	8.8(27)	30.4(12)	17.7(6)	9.5(36)	5.1(30)	3.8(30)
Canada	216.8(20)	137.5(15)	5.2(17)	1.5(17)	25.9(14)	19.9(15)	68.4(12)	16.6(11)	28.1(12)	7.2(38)	13.8(39)	6.4(41)	22.0(18)	8.6(5)	5.2(10)
Cape Verde*	73.7(42)	80.2(41)	1.6(43)	2.1(8)	5.0(39)	3.2(41)	6.7(44)	4.0(39)	5.5(42)	19.7(4)	25.9(16)	20.6(4)	4.6(39)	1.0(45)	0.7(45)
Chile	190.9(25)	148.1(11)	3.0(33)	0.8(40)	9.8(32)	8.1(33)	26.6(35)	7.1(33)	14.6(31)	20.7(3)	54.9(3)	25.7(2)	16.5(27)	4.8(33)	3.4(34)
Costa Rica*	181.0(29)	127.0(24)	5.3(15)	1.5(17)	7.4(35)	10.1(30)	17.9(39)	8.2(23)	13.6(34)	16.8(9)	59.7(2)	23.5(3)	19.9(20)	5.5(28)	3.9(28)
Denmark	242.8(9)	174.9(1)	4.0(25)	2.0(10)	33.9(1)	25.9(2)	70.6(11)	18.7(7)	32.2(5)	14.2(13)	16.9(32)	8.7(33)	25.2(8)	8.6(5)	5.7(4)
El Salvador**	38.2(46)	48.7(44)	1.0(45)	0.3(46)	1.4(45)	1.1(46)	2.6(46)	2.2(44)	1.5(47)	6.0(42)	8.7(43)	4.9(43)	3.5(43)	1.7(41)	2.5(36)
England & Wales	244.2(8)	156.6(6)	3.6(28)	1.7(13)	27.3(9)	20.9(11)	92.5(3)	21.9(5)	34.3(1)	9.8(21)	22.3(20)	10.2(25)	18.5(22)	6.8(24)	4.3(26)
Finland	238.6(12)	123.0(27)	3.8(26)	1.3(26)	17.1(24)	12.9(24)	86.9(5)	8.1(24)	19.3(24)	6.5(40)	25.5(17)	14.5(13)	25.3(7)	7.3(19)	4.5(23)
France	259.8(5)	121.1(28)	18.7(2)	1.6(16)	25.2(16)	15.9(21)	53.7(23)	5.0(36)	22.9(21)	9.5(22)	16.8(33)	7.7(38)	23.4(12)	8.6(5)	5.5(6)
Germany, F.R.	242.0(10)	149.7(10)	4.8(22)	1.0(33)	30.1(6)	22.8(7)	65.0(18)	7.6(28)	25.9(16)	10.2(20)	28.3(14)	15.1(11)	23.7(11)	7.7(15)	5.1(15)
Greece	182.9(27)	101.4(37)	2.0(40)	0.9(37)	7.3(36)	6.6(35)	56.4(22)	7.7(27)	17.4(25)	6.4(41)	15.5(37)	8.9(32)	10.9(34)	8.1(12)	4.9(16)
Guatemala*	54.4(44)	65.3(43)	1.4(44)	0.7(43)	1.4(44)	1.8(44)	3.1(45)	1.3(46)	1.9(44)	9.5(22)	16.4(34)	16.8(8)	3.9(41)	1.7(41)	1.3(41)
Hong Kong	227.4(15)	120.5(29)	19.9(1)	6.6(1)	17.5(23)	12.2(26)	71.9(8)	29.7(1)	10.0(37)	8.7(29)	18.0(28)	8.7(33)	3.0(44)	4.5(35)	3.7(32)
Hungary	275.9(1)	162.7(4)	10.8(5)	1.5(17)	31.9(4)	23.3(5)	76.1(6)	12.8(12)	25.0(17)	17.2(7)	41.6(4)	18.6(5)	22.6(16)	8.2(10)	5.4(8)
Iceland	178.3(30)	135.2(19)	2.0(40)	0.8(40)	19.0(21)	17.0(20)	30.7(31)	27.1(3)	15.7(28)	8.8(27)	31.0(10)	11.1(21)	19.6(21)	8.9(1)	4.0(27)
Ireland*	218.1(18)	158.2(5)	4.7(23)	2.3(6)	29.9(7)	24.1(4)	58.5(21)	18.7(7)	33.9(2)	7.9(34)	23.7(18)	11.4(20)	22.2(17)	7.6(16)	7.6(3)
Israel*	165.7(33)	140.6(14)	1.8(42)	1.0(33)	20.7(20)	15.4(22)	34.8(27)	11.1(15)	27.7(13)	5.3(45)	16.3(35)	9.4(29)	10.3(35)	7.1(22)	4.6(21)
Italy*	234.8(14)	125.4(25)	7.9(8)	1.2(30)	18.7(22)	12.7(25)	67.0(14)	7.6(28)	22.9(21)	10.6(18)	29.9(13)	14.6(12)	15.6(28)	8.6(5)	5.2(10)
Japan	193.9(24)	108.1(32)	2.5(37)	0.9(37)	16.4(25)	11.6(27)	33.7(29)	9.5(20)	6.4(41)	8.3(32)	63.1(1)	30.3(1)	4.1(40)	4.9(32)	3.2(35)
Kuwait*	132.9(37)	114.9(30)	0.6(46)	3.2(3)	2.2(43)	3.1(42)	30.6(32)	12.0(14)	14.6(31)	7.3(37)	8.4(44)	9.2(30)	6.3(37)	8.0(14)	8.8(1)
Luxembourg*	265.8(4)	168.4(3)	6.3(10)	2.1(8)	33.8(2)	24.2(3)	89.7(4)	9.8(16)	28.6(10)	11.7(16)	17.8(29)	11.5(18)	27.8(6)	6.4(25)	8.0(2)
Malta & Gozo*	252.7(6)	137.0(16)	5.8(12)	1.2(30)	14.2(28)	19.8(16)	63.7(19)	8.4(22)	32.8(4)	12.9(15)	38.1(6)	9.9(27)	18.0(24)	8.9(1)	0.7(45)
Mauritius	121.3(39)	73.8(42)	6.6(9)	1.1(32)	6.3(37)	4.3(40)	27.1(33)	4.0(39)	7.9(40)	13.6(14)	20.2(23)	8.2(36)	2.9(45)	3.5(38)	1.5(40)
Netherlands	270.5(3)	142.3(13)	2.5(37)	1.0(33)	25.8(15)	20.7(12)	103.2(2)	7.9(26)	32.2(5)	7.9(34)	23.6(19)	10.1(26)	25.0(9)	8.1(12)	4.8(17)
New Zealand	227.0(16)	152.7(7)	4.6(24)	1.7(13)	33.5(3)	27.6(1)	65.9(15)	17.2(10)	30.9(8)	9.1(25)	16.3(35)	7.7(38)	24.6(10)	8.7(3)	4.8(17)
Northern Ireland	215.8(22)	151.1(8)	2.9(34)	1.8(12)	26.4(11)	23.0(6)	71.6(9)	17.3(9)	32.2(5)	8.1(33)	21.7(22)	11.9(17)	17.5(25)	7.0(21)	4.6(21)
Norway	198.3(23)	130.1(22)	3.5(30)	1.4(22)	26.1(13)	20.0(13)	34.7(28)	7.2(32)	22.1(23)	9.3(24)	19.6(24)	10.7(23)	31.6(3)	7.5(18)	4.7(19)
Panama*	123.4(38)	103.2(35)	3.5(30)	3.1(4)	11.1(30)	6.6(35)	23.7(36)	6.1(35)	10.5(36)	18.2(6)	18.9(27)	8.7(33)	14.9(29)	4.4(36)	4.4(24)
Paraguay*	102.4(41)	110.1(31)	3.5(30)	1.5(17)	7.5(34)	6.2(37)	12.5(41)	4.5(37)	9.8(38)	16.0(10)	17.0(31)	12.2(16)	16.6(26)	5.4(29)	5.6(5)
Poland*	227.0(16)	130.4(21)	6.1(11)	1.3(26)	15.3(25)	11.4(28)	68.4(12)	8.9(21)	17.4(25)	15.2(11)	40.2(5)	15.6(10)	12.7(32)	6.9(23)	4.4(24)
Puerto Rico*	176.5(32)	107.5(33)	10.7(6)	2.9(5)	7.7(33)	7.2(34)	19.4(38)	9.7(17)	11.0(35)	8.7(29)	19.2(25)	7.2(40)	21.2(19)	6.2(27)	5.5(6)
Romania	157.3(35)	101.5(36)	4.9(21)	1.3(26)	10.2(31)	8.4(32)	38.7(26)	7.6(28)	14.2(33)	17.2(7)	30.8(11)	13.3(15)	11.1(33)	5.1(30)	3.5(33)
Scotland	270.9(2)	169.6(2)	3.7(27)	2.2(7)	29.8(8)	22.6(8)	109.6(1)	28.1(2)	33.3(3)	8.9(26)	22.3(20)	11.5(18)	18.3(23)	6.4(25)	3.8(30)
Singapore	237.3(13)	143.3(12)	17.5(3)	5.9(2)	21.8(19)	20.6(13)	72.5(7)	23.4(4)	17.3(27)	19.1(5)	32.3(8)	17.2(7)	5.0(38)	3.3(39)	3.9(28)
Suriname*	103.1(40)	83.2(40)	5.2(17)	1.4(22)	6.0(38)	6.0(39)	16.7(40)	2.8(41)	8.5(39)	22.8(1)	12.3(40)	8.0(37)	13.0(31)	1.7(41)	1.2(42)
Sweden	190.6(26)	137.0(16)	3.6(28)	1.4(22)	22.9(18)	17.1(19)	32.5(30)	9.7(17)	23.2(20)	8.6(31)	17.5(30)	9.2(30)	28.9(5)	8.2(10)	5.2(10)
Switzerland	239.6(11)	134.5(20)	8.2(7)	1.5(17)	26.2(12)	17.4(18)	62.0(20)	6.8(34)	30.0(9)	10.5(19)	19.0(26)	9.7(28)	31.0(4)	7.6(16)	5.2(10)
Syrian Arab Rep.	19.1(47)	14.4(47)	0.4(47)	0.2(47)	0.8(47)	0.5(47)	2.2(47)	0.7(47)	1.6(45)	0.9(47)	0.9(47)	0.7(47)	0.5(46)	0.7(46)	0.6(47)
Thailand	57.2(43)	36.7(46)	2.8(35)	1.3(26)	2.3(42)	1.2(45)	8.0(42)	2.4(42)	1.6(45)	4.2(46)	2.2(46)	1.1(46)	0.4(47)	1.1(44)	0.8(43)
Yugoslavia*	178.1(31)	104.5(34)	5.4(14)	1.0(33)	14.3(27)	9.8(31)	48.7(24)	8.1(24)	14.9(30)	11.7(16)	27.5(15)	13.5(14)	14.7(30)	3.7(37)	2.4(37)

NOTE: Figures in parentheses are order of rank within site and sex group. *1980 only. **1981 only. NA: Not available Source of data: World Health Statistics Annual 1982-1984

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